TAVRIS ON SEX DIFFERENCES • RANDI ON JOHNNY CARSON • NICKELL ON TURIN SHROUD

Skeptical Inquirer

THE MAGAZINE FOR SCIENCE AND REASON
Volume 29, No. 3 • May / June 2005

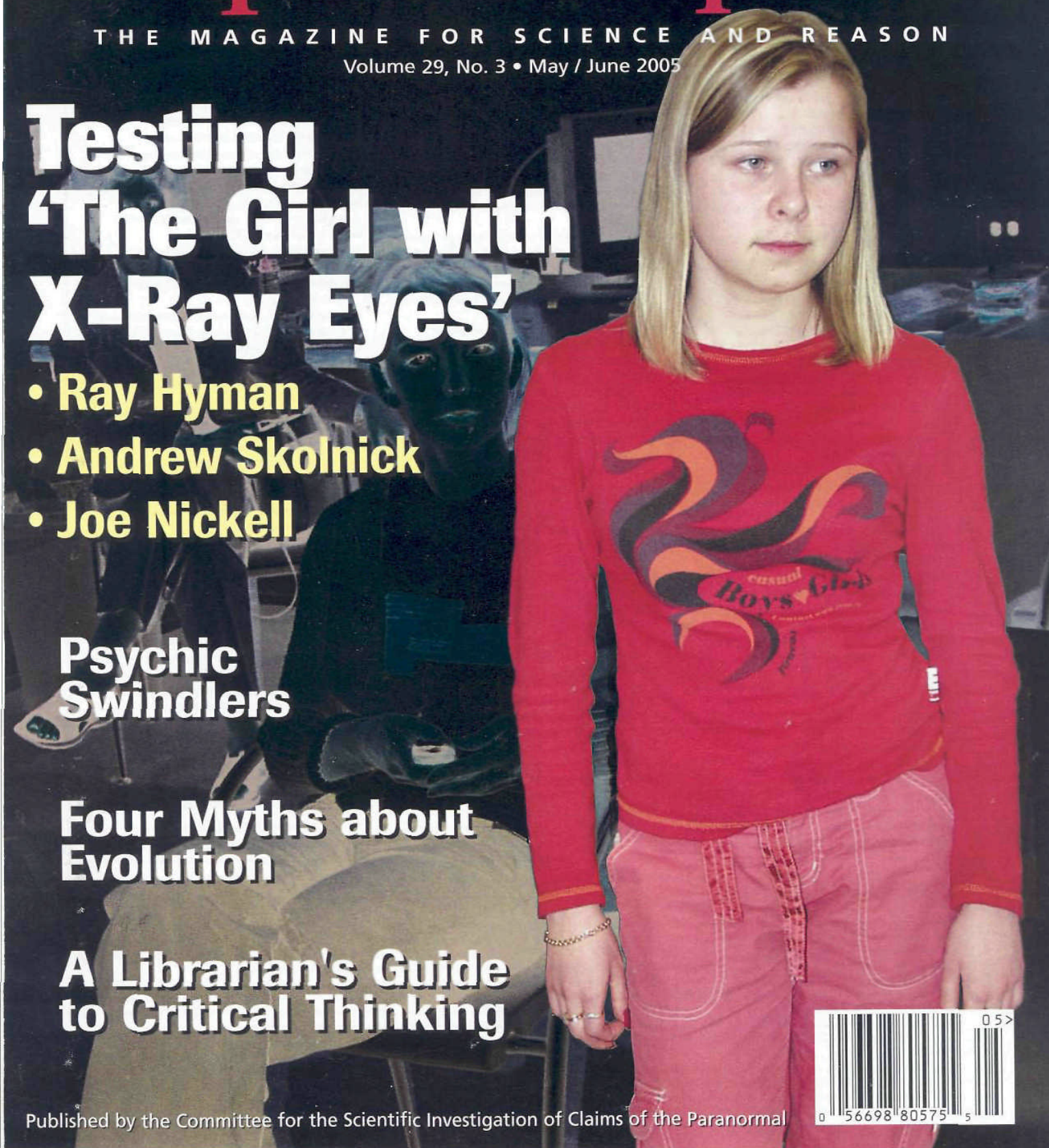
Testing 'The Girl with X-Ray Eyes'

- Ray Hyman
- Andrew Skolnick
- Joe Nickell

Psychic Swindlers

Four Myths about Evolution

A Librarian's Guide to Critical Thinking



Published by the Committee for the Scientific Investigation of Claims of the Paranormal

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of Claims of the Paranormal

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The SKEPTICAL INQUIRER (ISSN 0194-6730) is published bimonthly by the Committee for the Scientific Investigation of Claims of the Paranormal, 1310 Sweet Home Rd., Amherst, NY 14228. Printed in U.S.A. Periodicals postage paid at Buffalo, NY, and at additional mailing offices. Subscription prices: one year (six issues), $35; two years, $60; three years, $84; single issue, $4.95. Canadian and foreign orders: Payment in U.S. funds drawn on a U.S. bank must accompany orders; please add US$10 per year for shipping. Canadian and foreign customers are encouraged to use Visa or MasterCard.

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Manuscripts, letters, books for review, and editorial inquiries should be addressed to Kendrick Frazier, Editor, SKEPTICAL INQUIRER, 944 Deer Drive NE, Albuquerque, NM 87122. Fax: 505-828-2080. Before submitting any manuscript, please consult our Guide for Authors for format and references requirements. It is on our Web site at www.csicop.org/si/guide-for-authors.html and on page 64 of the November/December 2004 issue. Or you may send a fax request to the editor.

Articles, reports, reviews, and letters published in the SKEPTICAL INQUIRER represent the views and work of individual authors. Their publication does not necessarily constitute an endorsement by CSICOP or its members unless so stated.

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The SKEPTICAL INQUIRER is available on 16mm microfilm, 35mm microfilm, and 105mm microfiche from University Microfilms International and is indexed in the Reader's Guide to Periodical Literature.

Subscriptions and changes of address should be addressed to: SKEPTICAL INQUIRER, Box 703, Amherst, NY 14226-0703. Or call toll-free 1-800-634-1610 (outside U.S. call 716-636-1425). Old address as well as new are necessary for change of subscriber's address, with six weeks advance notice. SKEPTICAL INQUIRER subscribers may not speak on behalf of CSICOP or the SKEPTICAL INQUIRER.

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Skeptical Inquirer

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EDITOR'S NOTE

Science, Seeing, and Cosmological Worldviews

Ray Hyman's cover article describes tests he, Richard Wiseman, and Andrew Skolnick carried out on the so-called Russian "girl with X-ray eyes." It is, I think you will find, a model of scientific presentation. Andrew follows with his own first-person take on certain aspects of the tests. Joe Nickell, there as an observer, puts the Natasha business into broader perspective of other "eyeless vision" claims.

This is just the latest of a long series of tests over the years that CSICOP has encouraged, stimulated, or sponsored. It all brings back fond memories of a trip to China with a CSICOP delegation in 1988 when we tested, among others, Chinese children who were being promoted worldwide for alleged psychokinetic abilities. Our tests, led by James Randi, revealed that the girls were, with the complicity of their naïve mentor, engaged in childlike chicanery. (Our report appears in the SI anthology *The Hundredth Monkey.*)

In this issue Randi returns to offer a revealing and heartfelt tribute to Johnny Carson, and Paul Kurtz adds a note about Johnny's support of CSICOP as well. Carson, an amateur astronomer, was a good friend of science and skepticism. In addition to Randi's appearances, he had Carl Sagan on his show thirty times. Each gave Carl an opportunity to talk about the passion of scientific discovery and show how scientists strive to get at the truth about nature.

* * *

We continue a series of articles about evolution. Charles Sullivan and Cameron Smith discuss four commonly (mis)used phrases (e.g. "missing links") about it.

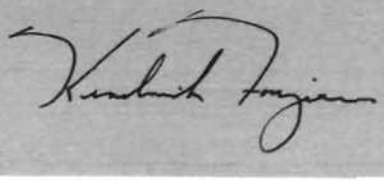
* * *

I recently judged at a regional science fair. Although my section was earth and space sciences, I encountered creationism. One high school student compared the modern scientific view of big bang cosmology with the creationist/intelligent design view . . . and claimed to find the former heavily influenced by ideology and dogma and the latter strongly supported by evidence! Not surprisingly, since she based much of her analysis on a well-known creationist physicist's book, prominently displayed, on this theme. Worse, in talking to her I found that her interest in these ideas wasn't casual. She already had a deeply ingrained ideological—almost strident and proselytizing—commitment to the creationist worldview of cosmology, and of science generally.

For me, there were two consolations: The judges assigned to her (I wasn't) were as appalled by this as I. And two booths away a project by an eleventh-grader analyzed the evolution of the human species through ages and locations of major fossil finds in Africa, Europe, and Asia. The brightest student I talked to, he had come to the United States from Manchuria in 2001 knowing no English. He has a passion to become a paleoanthropologist and do field work in China on human evolution. I think he will.

* * *

Be sure to check out the amusing Periodic Table on the back cover as it might be labeled by creationists. It is the work of Loren Williams, professor of chemistry and biochemistry at Georgia Tech. "The point I am trying to make," he says, "is that the creationist/intelligent design attack on biology is truly an attack on all science." It sure is.



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Florida Legislators, FSU Faculty Clash over Proposed Chiropractic School at University

A proposed chiropractic school at Florida State University (FSU) has pitted state legislators against school faculty in a battle that is equal parts science and politics.

In January, FSU considered a proposal to build the first public chiropractic school in the country. Florida Governor Jeb Bush and the state legislature have already set aside $9 million of annual funding for the proposed school. (Governor Bush has been quoted as saying that the deal was more about making peace between warring politicians than any particular interest in chiropractic medicine.) The proposal was voted down by the University Board of Governors.

Several Florida politicians voiced support for the chiropractic school; they contend that it would have attracted students and development dollars, as well as boosting the reputation of the chiropractic community. However, many FSU faculty members opposed it. They argued that chiropractic medicine is a pseudoscience and that such a school would hurt FSU's academic reputation. They also protested the way in which the deal was arranged, with little to no input from faculty members. Several part-time faculty members had threatened to quit if the school was approved.

One of the professors created a parody map of the campus, which designates a building for Chiropractic Medicine alongside other paranormal departments such as the Yeti Foundation, the School of Channeling and Remote Sensing, and a Crop Circle Simulation Laboratory.

This is not the first time that a partnership between a major university and a chiropractic organization has been attempted: in 1995, York University in Toronto considered a plan to affiliate themselves with the Canadian Memorial Chiropractic College. (There are several parallels: the proposal was not made public until 1998, and advocates promised that the deal would bring in millions of dollars and many new students while faculty opposed the deal on academic and scientific grounds.) After a protracted fight, York rejected the proposal in 2001.

—John Gaeddert

John Gaeddert is Assistant Director of Public Relations for CSICOP.

Shark Cartilage Cancer 'Cure' Shows Danger of Pseudoscience

The rising popularity of shark cartilage extract as an anti-cancer treatment is a triumph of marketing and pseudoscience over reason, with a tragic fallout for both sharks and humans, according to a Johns Hopkins biologist writing in the December 1, 2004, issue of *Cancer Research.*

"Since shark cartilage has been promoted as a cancer cure, not only has there been a measurable decline in shark populations, but cancer patients also have been diverted from proven, effective treatments," said Gary K. Ostrander, a research professor in the departments of Biology and Comparative Medicine at The Johns Hopkins University.

In the paper, titled "Shark Cartilage, Cancer, and the Growing Threat of Pseudoscience," Ostrander writes, "Crude shark cartilage is marketed as a cancer cure on the premise that sharks don't get cancer. That's not true, and the fact that people believe it is an illustration of just how harmful the public's irrationality can be."

In fact, Ostrander's paper details more than forty examples of tumors in sharks and related species, dating back to the mid-1800s. In the paper, Ostrander and a team of researchers from the Registry of Tumors in Lower Animals not only dissect what they call the "fallacious arguments" that have successfully convinced desperate cancer patients to purchase and ingest crude shark cartilage extract, but they also call for society to become more scientifically literate and, thus, less vulnerable to skillfully mass-marketed illogical claims.

"People read on the Internet or hear on television that taking crude shark cartilage extract can cure them of cancer, and they believe it without demanding to see the science behind the claims," Ostrander said. "This shows how the electronic media have increased the potential harm of pseudoscience, turning what would otherwise be quaint cultural curiosities into potential serious societal and ecological problems. The only way to combat this is to ensure that government leaders and media professionals receive adequate scientific training based on reason, and that they also develop critical thinking skills."

Ostrander traces the popularity of crude shark cartilage as a cancer treatment and preventive measure to I. William Lane's 1992 book titled *Sharks Don't Get Cancer*, which was further publicized by the CBS News program *60 Minutes* in 1993. Though Lane acknowledges in the book that sharks do, in fact, get cancer, he bases his advocacy of crude cartilage extracts on what Ostrander calls "overextensions" of some early experiments in which the substance seemed to inhibit tumor formation and the growth of new blood vessels that supply nutrients and oxygen to malignancies.

"The fact is that it is possible that highly purified components of cartilage, including from sharks, may hold some benefit for treatment of human cancers," Ostrander said. "The key will be to isolate these compounds and design a way to deliver them to the site of the tumor. Lane and others ignore these existing barriers and suggest that consuming crude cartilage extracts by mouth or rectum could be curative of all cancers—an approach for which there is no scientific basis."

—Johns Hopkins University

'Psychic' Con Artist Caught in Police Sting

At the 2004 Bayou Lacombe Crab Festival in Louisiana last July, a resident of Slidell, Louisiana, had a reading performed by a supposed psychic who called herself "Miss Jackson." While the woman sought the reading as entertainment, upon being informed that she had a terrible curse on her, she began to take the episode more seriously. But to her relief, Miss Jackson quickly informed her that the curse could be removed with the proper ritual, and the next day, the two arranged to get together and discuss removing the curse. That procedure, predictably, involved a large sum of money which was to be ceremonially buried in a specified location in a paper bag—with a banana.

Fortunately, the victim realized that she was being targeted by a con artist and contacted the Slidell Police Department. She was asked by investigators to go through with the meeting so that Miss Jackson could be caught

committing an act of fraud. Unfortunately, at the site, something raised the supposed psychic's suspicion, and she quickly gathered her magical implements and left the scene without performing the "necessary" ritual. (The victim did manage to retain the $5,000 in marked bills.)

On July 13, 2004, a team of officers arrested Jackson, also known as Lecia Urich, who operates a fortune-telling parlor in Kenner. Urich was booked on charges of attempted theft of an amount greater than $500. Another woman later came forward, reporting that she was similarly duped out of $37,000, so further charges have been added in the case, which is still awaiting a court appearance.

For a more detailed account of a similar case, see Amy Davis's article, "Psychic Swindlers" on page 38 of this issue.

—*David Park Musella*

David Park Musella is an editorial assistant with SKEPTICAL INQUIRER.

Internet Group Donates Evolution Texts to Dover High School

An international e-mail group that focuses on opposing the teaching of Intelligent Design (ID) creationism has donated over twenty science books to the Dover High School Library in Dover, Pennsylvania. The books include *What Evolution Is* by evolutionary biologist Ernst Mayr, *Intelligent Design Creationism and Its Critics* by Robert Pennock, and *Finding Darwin's God* by biologist Kenneth R. Miller.

Dover became the scene of a legal fight after supporters of Intelligent Design theory attempted to insert their viewpoint into science classes. The donated books arrived as lawyers argued in court over the fate of Intelligent Design "textbooks."

Similar conflicts over ID theory are taking place in Ohio, Kansas, Alabama, Arkansas, and elsewhere.

The cyber-activists from the DebunkCreation e-mail list at Yahoogroups, from the United States, the United Kingdom, South Africa, Canada, Australia, and Sweden, say they were motivated by reports that an "anonymous donor" gave sixty copies of the ID textbook *Of Pandas and People* to the school district. "We wanted students in Dover to have access to accurate information about science, about evolutionary biology, and about the real agenda of the Intelligent Design movement," says list founder Lenny Flank, a freelance writer from St. Petersburg, Florida.

CSICOP Launches Creation Watch Web Site

In an effort to help counter the misinformation spread on the Internet by creationist groups, the Committee for the Scientific Investigation of Claims of the Paranormal (CSICOP) has recently unveiled a "Creation Watch" Web site. In its early stages the site will collect all SKEPTICAL INQUIRER and *Skeptical Briefs* articles on the subject. The site will help promote good science education and an understanding of the evolutionary sciences, and address the fallacies of creation and Intelligent Design arguments while exposing the tactics used to mislead the public. In addition we hope to add valuable educational materials and links to other online sites containing useful information for educators, activists, and concerned citizens. The highlight of the site will be a Web column by Eugenie Scott, director of the National Center for Science Education (NCSE) and up to date reporting of news items from around the world. The Creation Watch Web site is at www.csicop.org/creationwatch/.

'Ancient Universe' Booklet Explains the Great Age of the Changing Cosmos

In several U.S. states there have been demands that discussions of the Big Bang and the vast age of the universe be excluded from science curricula in K–12 classrooms. In response, the Astronomy Education Board of the American Astronomical Society (AAS) put together an article first published in a newsletter for teachers on the Astronomical Society of the Pacific Web site.

The AAS has now expanded this article into "The Ancient Universe," an illustrated guide explaining how astronomers know that the cosmos is old and that it changes with time. The booklet is designed for school boards, principals, parents, and anyone interested in the scientific perspective on the age of Earth and the physical world.

The authors explain the evidence showing that we live in a universe that is between 10 billion and 15 billion years old and that both the universe and its contents undergo evolutionary change. A list of written and Web resources is also included.

The 20-page nontechnical booklet is available for free downloading on the Web site: http://education.aas.org/publications/ancientuniverse.html.

Astronomy, Astrology—What's the Difference? It's Politics

A saturation radio ad that confused astronomy with astrology was used to ridicule political incumbent Joel Trella for taking college courses in astronomy while serving as sheriff for Bergen County, New Jersey. The political ad, broadcast on a New York City radio station, derided Trella for using "astronomy" to make professional decisions.

At the beginning of the fifty-second spot, a male voice, pretending to be that of Trella, is singing the opening line from the song "Aquarius." He is interrupted by an alarmed female voice announcing that a prisoner is escaping from the jail. The Trella impersonator responds in shock, "That's impossible. Jupiter's orbiting!" At the end of

the ad, the female exclaims, "Look, another prisoner is escaping!" This time the Trella voice moans, "Ooh! What would the Maharishi do?" The ad closes with statements urging listeners to vote for Leo McGuire "because Bergen County needs a sheriff—not an astronomer."

Although the ad's writers are aware that Maharishi Yogi represents a particular school of astrology (Vedic), they must be clueless as to what astronomy is. The apparent scientific illiteracy of the campaign ad's writers produced a negative political spot criticizing the incumbent's education that is so far off base as to sound moronic.

A call to Trella's office revealed that the astronomy courses were taken to meet a university's degree requirements and were approved under the County's long-standing employee tuition reimbursement plan. In addition, according to Bergen County Community College, the incumbent played a critical role in the development of the school's criminal-justice program, one of the few in the state. Bill Maer, McGuire's campaign manager, when asked about the confusion between astronomy and astrology would only reply, "I'm sorry if the ad has offended anybody." It seems that the greater cost for getting a science education, at least in this case, is not the tuition, but the public ridicule for having improved one's critical thinking skills.

—Frank Reiser

Frank Reiser is in the Department of Biology at Nassau Community College in Garden City, New York.

Loftus Wins $200,000 Grawemeyer Award for Her Memory Research

CSICOP Fellow Elizabeth Loftus, a noted memory expert and professor of psychology and law at the University of California, Irvine, has been named recipient of the $200,000 Grawemeyer Award for Psychology.

The award was announced December 1 by UC-Irvine and the University of Louisville, which administers the award, endowed by industrialist H. Charles Grawemeyer in 1984.

Loftus's work has emphasized that memory is not like a tape recorder but creative and reconstructive, and thus susceptible to suggestion and manipulation. Her research has cast doubt on the validity of past "repressed" memories often brought out during psychotherapy. She has testified on such matters in many high-profile cases.

The Grawemeyer Web site said her research "has implications for law and for psychotherapy's methods of probing memory."

Loftus told the SKEPTICAL INQUIRER she was "shocked and delighted to be honored in such an enormous way."

In an earlier *Los Angeles Times* article, she called the award "a validation of work that I have been passionate about but also had to do in a climate of hostility and difficulty. So there's a special sense of vindication and appreciation that the enemies who have been trying to do me in for at least ten years did not succeed."

CSICOP Fellow Elizabeth Loftus.

She said she would use some of the money to support her research. Loftus is ranked 58th by the Review of General Psychology on its list of the 100 top psychologists of the twentieth century.

CSI's Anthony Zuiker: TV's Man of the Century?

I nominate Anthony E. Zuiker as TV's man of the century.

Okay . . . I'm talking about this century, not last, and, second, just who is Anthony Zuiker? Mr. *CSI*. The creator of the three blockbuster hits on CBS: *CSI*; *CSI: Miami*, and *CSI: New York*. All this from a guy who was apparently operating a tram not too very long ago.

My reason for naming him? Not the usual ones. While I'm sure that CBS is making plenty of money and spread-eagling the competition with its holy trinity of crime fighters, Zuiker has given us something much more important than any of that. He's given us back our sanity. He's also given us back our rationality, our empiricism.

He has, with his stories of forensic specialists using science and scientific method, given us back our very reason. The three *CSI* shows, which began in 2000, have all been in the top ten of the ratings and have made science, reason, and even thinking itself fashionable again.

Amid the so-called reality shows, the Springer-esque talk shows, and the inane sitcoms, critical thinking and intelligent fare are hard to find.

We have seen the flourishing of the supernatural on television, instead of a naturalistic view of life. *Touched By an Angel*, *Joan of Arcadia*, *The Others*, *Medium*, John Edward, James Van Praagh, not to mention supernatural shows like *The X-Files*, often champion superstition over science, belief over proof, wishful thinking over scientific method.

Viewers become indoctrinated into the fantastical, avoiding scientific methods and reasoning. *CSI* stepped up like a drill sergeant and began putting the people through their intellectual paces. Evidence, proof, reason, and scientific method are always stressed.

Will Zuiker continue his winning ways? Who knows? Will he continue to spread his brand of scientific Hellenization, a la Alexander the Great? Let's hope so.

But this much is certain. From both a ratings and a pro-science point of view, Anthony Zuiker is easily TV's early man of the century.

—Chris Volkay

Chris Volkay is a freelance writer in Los Angeles who specializes in championing science over superstition, rationality over religion, and debunking the paranormal.

Anthony Zuiker. (Photo by Frederick M. Brown/Getty Images)

Newspaper's 'Psychic Experts' Wash Out with Hurricane Predictions

Like Frances did three weeks earlier, Hurricane Jeanne cut a swatch of destruction across central Florida, striking the east coast at about midnight on the morning of September 26, 2004. But if the coastal residents were prepared for Jeanne's wrath, it was no thanks to the coast's *Florida Today* newspaper, headquartered in Melbourne. Or at least not to what the paper refers to as its three "psychic experts."

A September 20 story titled "Local psychics predict the weather: Will more storms batter Brevard?" carried the following predictions from its telepathetic trio, who "for the past three years . . . have participated in New Year's forecasts on politics, celebrities, weather, etc." None foresaw Florida's historic run of four major hurricanes or the role Jeanne would play.

According to staff writer Billy Cox, Shiraa Roccelle "was certain [Jeanne] wouldn't splatter into Florida." Roccelle is quoted as saying (or seering), "My sense is that it will come much closer to Georgia or South Carolina, and it'll miss us."

Next Elizabeth Cooper came to the plate: "It's going to dissipate—I don't think it'll be a hurricane."

Batting third, and playing way out in left field, Chris Jones: "*Georgia* is the first word that comes to mind with Jeanne," Jones said. "Jeanne is full of steam, but she'll hit land and blow out rather quickly." Jones was instead more concerned about Hurricane Karl, which, alas, never approached the United States.

—*Gary Posner*

Gary P. Posner is founder of Tampa Bay Skeptics and a CSICOP Scientific Consultant.

Centuries-old Puzzle Solved by Calgary Teen

In the early part of the sixteenth century, German artist, engraver, and master of perspective Albrecht Dürer, who often brought his powerful interest in geometry into his artistic pursuits, wondered whether all polyhedral forms could be reduced to two-dimensional forms with no overlapping by cutting along the edges of their faces. The question arose from the artist's pursuit of more accurate methods of representing the proper proportions of three-dimensional objects in two-dimensional art.

That question remained unanswered until it was solved last year by a fourteen-year-old Canadian student, Daniel Bezdek, who, like Dürer, has a keen interest in geometry and math in general.

The project won its author five awards at the Canada Wide Science Fair, held in St. John's, Newfoundland, Canada, in May 2004, garnering the young mathematician over $8,000 (Canadian) in prizes. The judges stated that Bezdek's research was so complex they needed to bring in additional mathematicians to properly evaluate it.

Though five centuries have passed since Dürer first asked the question, Bezdek is reported to have spent just two weeks solving it.

—*David Park Musella*

Recent Deaths

Ernst Mayr, considered by some the leading evolutionary biologist of the twentieth century, one of the architects of the modern evolutionary synthesis that reconciled Darwin's theories of evolution with new findings in genetics, population biology, and diversity, professor emeritus of zoology at Harvard (the Museum of Comparative Zoology), promoter of evolutionary biology as a discipline and the philosophy of biology as a field, author of such works as *Birds of the Southwest Pacific, Animal Species and Evolution, The Growth of Biological Thought, The Evolutionary Synthesis, This is Biology, Toward a New Philosophy of Biology, What Evolution Is,* and (most recently) *What Makes Biology Unique?,* on February 3, 2005, in Bedford, Massachusetts, at the age of 100. (Mayr's short article "The Concerns of Science" appeared in the July/August 1999 SKEPTICAL INQUIRER Science & Religion issue.)

Ernst Mayr.

Alleged Reagan Astrologer Dies

Joyce Jillson, the actress turned self-styled "Hollywood Astrologer" who claimed to have cast horoscopes for President and Mrs. Reagan, died October 1, 2004. Her obituary again raised questions about the Reagans' reliance on astrology, as well as Jillson's alleged role in providing such advice.

Jillson, one-time actress on the racy 1960s television series *Peyton Place*, garnered worldwide publicity for her astrology business in 1988. She claimed that she was actually a guest at the White House in 1981 following the attempted assassination of President Reagan. Through their spokespersons, the Reagans denied that was true.

Jillson's claim followed revelations by former White House chief of staff Donald T. Regan in his book, *For the Record.* In addition to characterizing President Reagan as likeable but disturbingly susceptible to manipulation, especially by a meddling First Lady, Regan exposed what he called "probably the most closely guarded domestic secret of the Reagan White House." He revealed that the First Lady relied on an astrologer to determine the best time for every presidential move, from travel to speeches and more: The astrologer, according to *Time* magazine, cast the charts of Reagan (an Aquarius) and Soviet president Mikhail Gorbachev (a Pisces) and "determined that 2 P.M. on Dec. 8, 1987, was the most propitious moment for them to sign the intermediate-range nuclear forces treaty."

Don Regan did not name the prognosticator except to say that she was "an astrologer in San Francisco." Joyce Jillson was instead from Los Angeles, but she quickly claimed that she had "spent a lot of time of the White House" after the assassination attempt and had recommended George H.W. Bush as Reagan's running mate in 1980. However, as *Time* reported, "Neither the President nor the First Lady recalls ever meeting Jillson."

Soon, reporters had identified the real astral consultant as Joan Quigley, who was said to be "not unlike many of the First Lady's California friends": a wealthy conservative socialite. Quigley had authored three books on astrology and had been advising the Reagans ever since the early 1970s when television talk-show host Merv Griffin introduced her to Mrs. Reagan. A long-time acquaintance described Quigley as "a little wacky."

President Reagan tried to minimize his connection to astrology, but, according to *Time*:

> Both Reagans have always been superstitious, observing such harmless rituals as knocking on wood and walking around, not under, ladders. The President puts a certain coin and a gold charm in his pocket each morning, and routinely tosses salt over his left shoulder not just when he spills some but before all his meals.

Also, in his autobiography, written in 1965, Reagan described his and his wife's attraction to published astrological forecasts.

Reagan's son Michael told me, when I was on his radio show, that his father often mentioned how his dog Rex would refuse to enter the Lincoln bedroom which was supposedly haunted. Reagan's daughter, Patti Davis, recalled he once replied when asked about Lincoln's ghost: "I haven't seen him yet. But I do believe he's here."

In her 1989 memoir, Nancy Reagan also attempted to play down the astrology issue, stating it had had no impact on American policy matters. However, the following year Quigley wrote in her own book, *What Does Joan Say?*, that her involvement with Mrs. Reagan gave her "a direct line to the President." She said she persuaded him, for instance, to soften his "evil empire attitude" toward Gorbachev prior to their Geneva Summit meeting.

There may have been further unintended consequences. According to Jack Anderson and Dale Van Atta, syndicated columnists, the Soviet consulate was believed to have tapped into unsecured phones lines over which Mrs. Reagan and her stargazer routinely discussed national policy matters. Reportedly, White House sources, the CIA, and the National Security Council believed that the Soviets had recorded hundreds of such calls.

However credible the superstitious Reagans initially found astrology, "In 1981," reported *Time*, "Quigley made Nancy a believer by showing how the astrologer's charts could have foretold that the period on or around March 30, 1981, would be extremely dangerous for the President."

Apparently Mrs. Reagan did not stop to recall the adage that hindsight is always 20/20. Astrologers, like other mystics, often make such retroactive claims. (One psychic, Tamara Rand, seemed especially accurate in predicting the attempted assassination of Reagan, reputedly on a TV show on January 6, 1981. She mentioned the initials "J.H." and other details, saying Reagan would be shot in the chest during a "hail of bullets," and that it would transpire in late March or early April. Indeed, John Hinkley shot Reagan on March 30. However, an AP reporter discovered the video was a fake, filed the day *after* the assassination attempt.)

—Joe Nickell

Joe Nickell is CSICOP's Senior Research Fellow.

Indian Rationalist H. Narasimhaiah *Dies at 84*

Eminent rationalist H. Narasimhaiah, founder of the Bangalore Science Forum, CSICOP Fellow, and eminent skeptic, died January 31, 2005, at the age of 84. He was one of the greatest minds in India, promoting the public understanding of science and the spirit of critical inquiry. He was cremated in his native Hosur village with full state honors.

"Do not accept anything without questioning" was his guideline. During the information technology revolution, he remained committed to promoting pure science and a scientific outlook to life. His outstanding contribution was the founding of the Bangalore Science Forum in 1962, which is dedicated to promoting the scientific temper. Developing scientific temper is incidentally one of the Fundamental Duties enshrined in the Indian constitution, and he was one of the few who took this duty seriously in a country where courting fraudulent god men, whom he vehemently opposed, has become fashionable.

Narasimhaiah strongly opposed superstition and obscurantism and had challenged god men, including Sai Baba. Ten years ago, I was fortunate to have a brief talk with him. Students I asked immediately knew where his office was. I was struck by the utter simplicity of his office, equipped with a few simple, foldable chairs and small table. I learned that he had also been living in a similarly simple room without even a bed for fifty-three years. This was a man who had, besides founding

H. Narasimhaiah.

the Bangalore Science Forum, been the vice-chancellor of Bangalore University from 1972 to 1977 and known worldwide because of his commitment and activities to promote science. I have never met someone so prominent and humble at the same time.

Full-page newspaper reports in several Bangalore newspapers reviewed his lifelong achievements. They lauded his humor and discussed many of tricks he used to lure students into science classes. Among the honors bestowed on him were the Sir M. Visweswaraya Award for the popularization of science and the Padma Bhushan Award of the Government of India.

Skeptics worldwide will miss him.

—Amardeo Sarma

Amardeo Sarma is chairman of the German skeptics group GWUP and a member of the CSICOP executive council.

Quoteworthy

"Science is always more unsolved questions, and its great advantage is you can prove something is true or something is false. You can't do that about human affairs—most human things can be right from one point of view and wrong from another. It is the most wonderful feeling when you come to a real answer. This is it, and this is correct! In science, you know you know."

—Nobel laureate physicist Hans Bethe, who discovered how the sun and other stars generate their energy and who died March 6, 2005, at the age of 98. □

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UPDATE

HEADQUARTERS EXPANSION AMHERST, N.Y.

2005

The Center for Inquiry – *Transnational* announces a major 13,600 square foot expansion at its Amherst, New York, headquarters. Slated for completion during 2005, the $2.54 million expansion will more than double conference and seminar capacity, add ten urgently-needed new offices, and enlarge the Center's world-class libraries. This capital project will relieve serious overcrowding and capacity problems, supporting projected program growth of the Center and its affiliate organizations, including the Committee for the Scientific Investigation of Claims of the Paranormal, for years to come.

We are bursting at the seams, and cannot continue program growth without expanding our headquarters. The shelf space of our skeptical and freethought library—the finest in the world—is full. Yet donated books, magazines, and archival materials keep coming. There's an office or workstation everywhere we can put one, yet program and staffing needs continue to grow. Our existing conference and seminar space, opened in 1995, is often overwhelmed by larger and more complex events.

The headquarters expansion is one focus of our $26.26 million New Future Fund capital campaign. Your gift to the New Future Fund today will help to make our desperately-needed headquarters expansion a reality. We seek gifts of cash, publicly-traded securities, paid-up insurance policies, and other assets. Attractive incentive and naming opportunities are offered in acknowledgment of larger gifts. All gifts are fully tax-deductible as provided by law. Please join us and declare your support. Write, call, email, or send the bound-in postcard today!

The new addition will be erected just east of the present building, constructed in 1995.

Three large seminar rooms open off of the new building's central corridor.

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Brains, Biology, Science, and Skepticism

On Thinking about Sex Differences (Again)

CAROL TAVRIS

In 1977, my friend and colleague Carole Wade and I wrote one of the first textbooks in women's studies. We called it *The Longest War: Sex Differences in Perspective.* The publisher briefly worried about the title, on the grounds that it was unduly gloomy, though she was cheered when someone from the U.S. Army called to order several thousand copies—until he learned it wasn't about Vietnam.

There is a benefit to having written about sex differences for so long. You get to take the long view of an issue, to see it, as it were, in perspective—for example, how women's rights have risen and fallen, come and gone, and returned and gone again, depending on the state of the economy and the current level of hysteria among religious conservatives about sex, marriage, and morals. In America, anything over ten years is the long view, and everything over twenty-five years is the ancient view.

There is a disadvantage to having written about sex differences for so long. It makes me feel ancient and irritable. You would feel that way too, if you had to read the same damned debate over and over and over and over. In America, hardly anyone remembers anything that happened more than a few years ago, and so, every time someone comes along speculating that, say, men have an innate advantage over women in math and science, the country gets riled up all over again. This time the someone was the president of Harvard, Lawrence Summers, so he caused a lot of riling.

So first, some perspective. Americans, being an individualistic culture, tend to ascribe the origins of people's difficulties to something in them—low motivation, bad personality, wonky hormones, or a gene for laziness. (They make personality attributions even when, in experiments, they have been *explicitly informed* that the other person is doing what they were ordered to do.) Therefore, whenever some individual or some group isn't doing as well as others, the immediate temptation is to assume the reason lies in the "inherent" qualities of the individual or group.

No serious scholar disputes any longer that motives, hormones, and genes affect behavior; it's just that they are not the only factors that do. For example, in the 1970s psychologists worried that women suffered from an internal "fear of success" that was keeping them out of law and medical schools and other traditionally male careers. When discrimination was made illegal, "fear of success" was trampled under the crush of women entering professional schools and occupations formerly closed to them, including bartending and boxing. I will be very happy to entertain Summers's speculations about why more women are not at the higher echelons of math and science when the notion that they don't belong there is as dead as fear of success. We are not there yet by a long shot. Just read any of the letters to the editor written, in the aftermath of the Summers affair, by women in science, and those who abandoned the science they loved, describing the insults, rejections, and humiliations they have endured.

Dr. Summers has had many defenders who have argued that this whole kafuffle is just a politically correct temper tantrum by those who can't abide even asking sensitive questions such as whether sex differences occur and if so, why they do. These questions should certainly be on the table, they say, and scholars should be able to debate them without uproar and censorship. Indeed they should! They have been doing so for thirty years! If Dr. Summers had discussed the matter by offering any data at all from those thirty years of research to bolster his case, I doubt his audience would have been so appalled. For the record, let's note that Dr. Summers did not present any data in his remarks. A *New York Times* editorial observed wryly that "the transcript provides the best possible refutation of the charge of political correctness. Whatever Dr. Summers was doing at the conference, it had nothing to do with serious intellectual inquiry. 'I don't think anybody actually has a clue,' was one operative phrase."

Carol Tavris, Ph.D., is a social psychologist and author, among other books, of The Mismeasure of Woman: Why Women are Not the Better Sex, the Inferior Sex, or the Opposite Sex *(Touchstone) and, with Carole Wade,* Psychology, *and* Invitation to Psychology *(Prentice Hall). She is a CSICOP Fellow.*

So let's examine some of the evidence, starting with Summers's anecdote about his daughter's preference for dolls over trucks—parents' favorite kind of data. Developmental psychologists have shown that three- to seven-year-old children do indeed often behave like sexist piglets, to the despair of egalitarian parents and the gloating of traditionalist ones. It doesn't much matter how parents treat their children during these years; the kids know what they want to play with, and don't try giving a boy a Barbie. During those years, children are acquiring a "cognitive schema" for gender, fitting in the qualities and activities that seem to fit into each category—rough, spiky, black, mechanical things are "male," for example, and soft, pink, fuzzy, or flowery things are "female"; black bears are male and pink poodles are female. At this age, they will insist that only boys can be doctors, even if their *mother* is a doctor. But their gender-typed behavior as five-year-olds often has little to do with how they will behave at twenty-five or forty-five. Children can grow up in an extremely traditional, gender-typed family and yet, as adults, find themselves in careers or relationships they would never have imagined for themselves—as the growing number of men who are nannies, nurses, and homemakers confirms.

But what about all those studies that are finding sex differences in the brain—say, those that find a sex difference in lateralization? For some types of tasks, especially those involving language, men seem to rely more heavily on one side of the brain whereas women tend to use both sides. This is incredibly interesting, but consider these three caveats:

First, in these studies both sexes usually do *equally well* on the task at hand. So what does the lateralization difference actually mean for anyone's behavior in real life? Who knows?

Second, the overlap between the sexes in these studies is often greater than any average difference between them. Scientists keep saying this, but no one seems to listen. Jeannette McGlone summarized her own findings on sex differences in the brain this way: "One must not overlook perhaps the most obvious conclusion, which is that basic patterns of male and female brain asymmetry seem to be more similar than they are different." Of course, everyone then overlooked it.

Third, sex differences in the brain could be the result rather than the cause of behavioral differences. Experiences in life are constantly sculpting the circuitry of the brain, affecting the way brains are organized and how they function. For example, bilingual people who learned both of their languages in early childhood tend to use a single, uniform Broca's area when they generate sentences in the two languages. But in people who learned a second language during adolescence, Broca's area is divided into two distinct regions, one for each language. Playing a stringed instrument in childhood enlarges parts of the brain associated with music production, and driving a taxi for years enlarges parts of the brain involved in spatial orientation. Obviously, women and men often have different experiences in childhood that could affect their brains accordingly. A scientist who identified lateralization differences in one MRI study concluded, "We don't know if the difference [we found] is because of the way we're raised, or if it's hard-wired in the brain."

Lawrence Summers posed two explanations for the underrepresentation of women in math and science: the "intrinsic aptitude" hypothesis and "socialization." The current evidence suggests that both are wrong. Males may indeed have an "innate" advantage at the extreme end of the bell curve, up there in the stratosphere of genius, but for everyone else in the vast middle, the similarities between the sexes in behavior and aptitude are far greater than the differences.

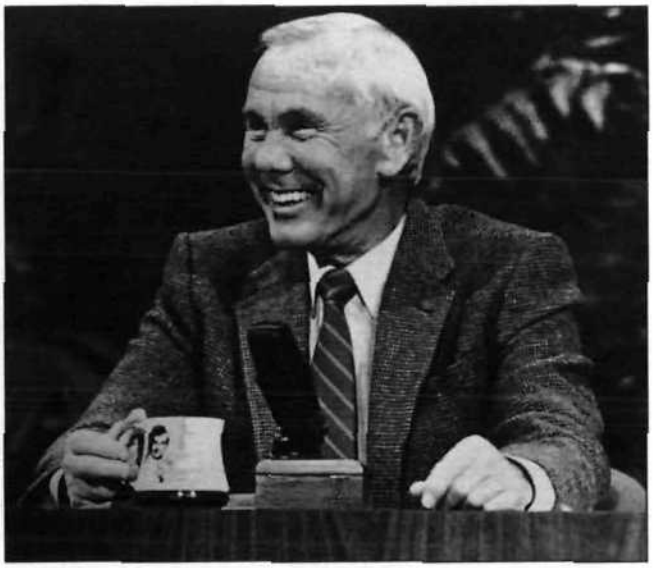
But "socialization" is wrong too. Occupational choices are not especially determined by events in our childhoods or by how our parents raise us. They are, as sociologists have found, more determined by the structure of occupations and how much time and commitment a career demands of its employees; the existence of good day care for workers who have children; the percentage of women in a field (to women, a signal of how welcome they are, and to men, a signal of what their income will be); what a person's friends and peers are doing; what the economy encourages or discourages; and the cultural norms within a profession.

Suppose a chocolate factory has an assembly line that is geared to the average height of a man, say 5'9". Workers who are 5'5" or shorter cannot be hired. Would we conclude that women's underrepresentation in that factory was due to Chocolate Aversion Disorder, Fear of Chocolate, or a Just Don't Wanna factor? We would say, oh, for crying out loud, adjust the height of the £v©ℜ!η&! assembly line, or find comparable work for the women—*and men*—who are shorter than 5'5".

Therefore, in the final analysis, I think it's time to dump the ancient, boring question: "Do 'men' have a greater intrinsic aptitude for math and science than 'women' do?"—as if the sexes were separate categories like furniture and fruit. The question should be: "What can we do to make sure *that anyone who has any interest in or aptitude for science—anyone of any sex or ethnicity or age or background or income—is encouraged to learn more and succeed in a career in science?"* Today, when the president of the United States thinks the jury is still out on evolution; when teachers are afraid to teach evolution lest they incur the wrath of parents; when the majority of Americans embrace astrologers, psychics, and scam artists; when government agencies and Web sites are censoring scientific findings that do not support administration policies on everything from global warming to the alleged psychological effects of abortion and nonmarital sex—we cannot afford to make a single citizen feel unwelcome in the halls of science. The president of Harvard, of all people, should know that. □

Johnny Carson Remembered

JAMES RANDI



Johnny Carson laughs on the set of *The Tonight Show*. Carson, a pioneer of late night television comedy, died January 23, 2005, at the age of 79. (AFP/Getty Images)

A very bright light in my life has gone out.

Forgive me if what follows is a little disorganized, but I've just heard that we've lost Johnny Carson. It doesn't seem possible. We were in touch just a week ago.

I'm writing this as a sort of catharsis. The phone has been ringing incessantly, and I'm hardly able to speak coherently to those who express their grief and shock.

Just a few years ago I asked John about his triple bypass and how it was affecting his life. Typically, he told me that it had made such a difference to him in so many ways, that he would recommend it to everyone, "whether they need it or not." I now regret that I was never able to ask him a burning question: whether he'd given up smoking. I suspect he hadn't, since those of us who appeared on his show were well aware that he smoked all through the taping, concealing that fact by waiting until the camera was on a guest and would probably stay there for at least thirty seconds. There was an exhaust fan under the desk, always a lit cigarette within reach, and the audience had been prompted to simply not notice that he was smoking in between camera shots. I mention this because it seems pretty evident that tobacco got the man, as it does so many of us. It makes me hate the product— and those who promote it—even more than I did previously; it took away my father, too.

John was generous, kind, and caring. The James Randi Educational Foundation received several checks—six-figure checks—from this prince, because he really believed in what we were doing, he followed our Web page closely, and he would call every now and then with comments and suggestions for subjects he believed to be important. The phone will never again give me the delight of hearing his voice, and that is the burden I will have to live with. I will miss him more than I can say.

There was always a bit of mystery connected with my appearances on the show. John would never wish to meet guests before they actually walked out onto the set, but I was accustomed to hearing a tap on the door about ten minutes before airtime, opening it to find him standing there. He was thoughtful enough to want to ask me what I wished to promote during my appearance, and always had some sort of anecdote to share with me. Once, after he'd left my dressing room, I was asked by the prop man, "Do you know where the body's hidden, or something?" He just couldn't understand why John had broken his rule in my case.

When the famous exposé of Peter Popoff occurred on his show, conditions had been somewhat changed over those that usually applied. Earlier that afternoon I had met with Fred DeCordova, his director, I had shown him the video footage that we had exposing Popoff's scam, and when Fred said that he would show the video to Johnny, I'd suggested that it might be better to surprise him. "No," Fred had insisted, "Johnny doesn't like surprises." "Well, just think for a moment about the expression he'll have on his face," I told him. That did it. We went on-camera that evening without Johnny knowing the big surprise — that Popoff had a

James "The Amazing" Randi was a founding member of the Committee for the Scientific Investigation of Claims of the Paranormal and is currently head of the James Randi Educational Foundation.

concealed receiver in his ear. John let out an expletive that was dropped out of the tape before it was broadcast later in the evening, and DeCordova had to agree that we'd made the right decision.

John and I were fond of pertinent quotations. We'd exchange them by e-mail or phone, really, I suspect, trying to out-quote one another. Here's one I'll send him right here and now:

> Love is a bad tenant for one's bosom; for when compelled to quit, he always leaves the mansion more or less out of repair.
>
> —C.F. Hoffman 1806–1884

I loved you, Johnny. We all did.

Yes, I'm rambling, because I just don't know what else to say. I will miss Johnny Carson like no other person in my life. He was such a good man, one of my minor gods, and a good friend that I regret to say I did not meet again in person after he left television so long ago. Just one small example, if I may, of how generous he was. When I called and asked him if he might place a telephone call to Martin Gardner on that gentleman's ninetieth birthday, John had no hesitation agreeing to do so. "I've got most of his books," he told me, "and it'll be fun to speak with him." They did speak, on the afternoon of Martin's birthday, for some twenty minutes. That's the kind of gentleman that Johnny Carson was.

John, I will miss you, as will so many millions here and around the world, but your legacy lives on. I've just run out of words.

The editors of SKEPTICAL INQUIRER wish to add their lament at the death of Johnny Carson. He had a skeptical mind, ever willing to poke holes in sham and pretense. In addition to Carson's broadcast of Randi's classic exposé of Peter Popoff, he was complicit in the scuttling of Uri Geller! Interestingly, Carson once featured a young lady who claimed to be a psychic card reader. "I'll be damned if I know how she did it," he is alleged to have remarked. This prompted CSICOP to invite her to SUNY at Buffalo in order to test her powers. We were able to demonstrate that she was a trickster. Martin Gardner said that she used the Matt Schulien forced card trick, and Randi caught her on camera peeking! That's psychic?

Carson was a subscriber to SKEPTICAL INQUIRER (and *Free Inquiry*), and he made several four-figure contributions in response to our fund appeals. Alas, there are all too few figures in the media with enough guts to criticize hoaxers and defend skeptical inquiry. Steve Allen was a notable exception, but he is gone as well. Luckily, Penn and Teller are still in action, as is, of course, the inimitable Randi.

—*Paul Kurtz*

Claims of Invalid 'Shroud' Radiocarbon Date Cut from Whole Cloth

JOE NICKELL

Longtime Shroud of Turin devotee Ray Rogers, a retired research chemist, now admits there is the equivalent of a watercolor paint on the alleged burial cloth of Jesus. By tortuous logic and selective evidence, however, he uses the coloration to claim the "shroud" image was not the work of a medieval artist (Rogers 2004, 2005). Rogers follows many other shroud defenders in attempting to discredit the medieval date given by radiocarbon testing (Nickell 1998, 150–151).

In a paper published in *Thermochimica Acta*, Rogers (2005) claims that earlier carbon-14 dating tests—which proved the linen was produced between 1260 and 1390 (Damon et al. 1989)—were invalid because they were conducted on a sample taken from a medieval patch. "The radiocarbon sample has completely different chemical properties than the main part of the shroud relic," Rogers told BBC News ("Turin" 2005).

In fact, the radiocarbon sample (a small piece cut from the "main body of the shroud" [Damon 1989, 612]) was destroyed by the testing. Rogers (2005) relied on two little threads allegedly left over from the sampling,[1] together with segments taken from an adjacent area in 1973. He cites pro-authenticity researchers who guessed that the carbon-14 sample came from a "rewoven area" of repair—"As unlikely as it seems," Rogers admitted to one news source (Lorenzi 2005). Indeed, textile experts specifically made efforts to select a site for taking the radiocarbon sample that was away from patches and seams (Damon et al. 1989, 611–612).

Rogers compared the threads with some small samples from elsewhere on the Shroud, claiming to find differences between the two sets of threads that "prove" the radiocarbon sample "was not part of the original cloth" of the Turin shroud (as stated in his abstract [Rogers 2005, 189]).

The reported differences include the presence—allegedly only on the "radiocarbon sample"—of cotton fibers and a coating of madder root dye in a binding medium that his tests "suggest" is gum Arabic. He insists the sampled area was that of an interwoven medieval repair that was intentionally colored to match the "older, sepia-colored cloth" (Rogers 2005, 192, 193).

However, Rogers's assertions to the contrary, both the cotton and the madder have been found elsewhere on the shroud. Both were specifically reported by famed microanalyst Walter McCrone (1996, 85) who was commissioned to examine samples taken by the Shroud of Turin Research Project (STURP). After McCrone discovered the image was rendered in tempera paint, STURP held him to a secrecy agreement, while statements were made to the press that no evidence of artistry was found. McCrone was then, he says, "drummed out" of the organization (Nickell 1998, 124–125; 2004, 193–194). As evidence of its pro-authenticity bias, STURP's leaders served on the executive committee of the Holy Shroud Guild.

Not only did McCrone find "occasional" cotton fibers on the Shroud, but the source of Rogers's sample, Gilbert Raes, has since been challenged as to his claim, cited by Rogers (2005, 189), that "the cotton was an ancient Near Eastern variety." In fact, others—including French textile expert Gabriel Vial and major pro-shroud author Ian Wilson (1998, 71, 97)—believe the cotton may be entirely incidental. They point out it could have come from the cotton gloves or clothing of the Turin cloth's handlers or a similarly mundane source.

On the tape-lifted STURP samples (affixed to microscope slides), McCrone found a variety of substances (including mold spores and wax spatters). Major pigments were red ocher (in "body" areas) and vermilion (together with red ocher in the "blood" areas), contained in a collagen tempera binder. He also found the madder,[2] in addition to orpiment, azurite, and yellow ocher pigments, as well as paint fragments, including ultramarine and titanium white—together suggestive of the shroud's origin in "an artist's studio" (McCrone 1996, 85, 135).

Astonishingly—and with serious implications to the spirit of peer review—Rogers omits any mention of McCrone's findings from his report while insisting elsewhere, "let's be honest about our science" (Rogers 2004).

Although Rogers is a research chemist, unlike McCrone he is not an internationally celebrated microanalyst with special expertise in examining questioned paintings. Working in his "home laboratory," he did not, as far as his report informs, use a "blind" approach as McCrone did to mitigate against the subjectivity that has continually plagued the work of shroud advocates. Moreover, McCrone once referred to Rogers's and his fellow STURP coauthor's "incompetence in light microscopy" and pointed out errors in the test procedures they relied on (McCrone 1996, 157, 158–171).

Rogers (2005) now also reports the presence of vanillin in the lignin of the radiocarbon-sample area, in contrast to its reported absence in other areas of the cloth. This is a dubious finding given his extremely limited samples. He attempts to date the shroud by the amount of the lignin decomposition but admits that that method can offer only an accuracy range of a whopping 1,700 years (contrasted with about 150 years by radiocarbon dating). He concedes that the decomposition could have been accelerated by the baking of the cloth in its reliquary that occurred during the fire of 1532, but thinks it unlikely the cloth is medieval.

However, apart from the fire damage, the cloth is remarkably well preserved for a reputed age of nearly 2,000 years. Also, no examples of its complex herringbone weave are known from the time of Jesus when, in any case, burial cloths tended to be of plain weave (Nickell 1998, 35; Wilson 1998, 98–99, 188; Sox 1981). In addition, Jewish burial practice utilized—and the Gospel of John specifically describes for Jesus—*multiple* burial wrappings with a *separate* cloth over the face.

Other evidence of medieval fakery includes the shroud's lack of historical record prior to the mid-fourteenth century—when a bishop reported the artist's confession—as well as serious anatomical problems, the lack of wrap-around distortions, the resemblance of the figure to medieval depictions of Jesus, and suspiciously bright red and picturelike "blood" stains which failed a battery of sophisticated tests by forensic serologists, among many other indicators. These facts argue against Rogers's assertions that the shroud is neither a forgery nor a miracle—that "the blood is real blood"[3] and the image was produced by "a rotting body" (Rogers 2004).

Science has proved the Shroud of Turin a medieval fake, but defenders of authenticity turn the scientific method on its head by starting with the desired conclusion and working backward to the evidence—picking and choosing and reinterpreting as necessary. It is an approach I call "shroud science."

Notes

1. Ian Wilson (1998, 187) reported that the trimmings "are no longer extant."

2. Red lake colors like madder were specifically used by medieval artists to overpaint vermilion in depicting "blood" (Nickell 1998, 130).

3. Rogers (2004) does acknowledge that claims the blood is type AB "are nonsense."

References

Damon, P.E., et al. 1989. Radiocarbon dating of the Shroud of Turin. *Nature* 337 (February): 611–615.

Lorenzi, Rossella. 2005. Turin shroud older than thought. *News in Science* (http://www.abc.net.au/science/news/stories/s1289491.htm), January 26.

McCrone, Walter. 1996. *Judgment Day for the Turin Shroud.* Chicago: Microscope Publications.

Nickell, Joe. 1998. *Inquest on the Shroud of Turin: Latest Scientific Findings.* Amherst, N.Y.: Prometheus Books.

———. 2004. *The Mystery Chronicles.* Lexington, Ky.: The University Press of Kentucky.

Rogers, Raymond N. 2004. Shroud not hoax, not miracle. Letter to the editor, SKEPTICAL INQUIRER 28:4 (July/August), 69; with response by Joe Nickell.

———. 2005. Studies on the radiocarbon sample from the Shroud of Turin. *Thermochimica Acta* 425: 189–194.

Sox, H. David. 1981. Quoted in David F. Brown, Interview with H. David Sox, *New Realities* 4:1 (1981), 31.

Turin shroud "older than thought." 2005. BBC News, January 27 (accessed at http://news.bbc.co.uk/go/pr/fr/–/2/hi/science/nature/4210369.stm).

Wilson, Ian. 1998. *The Blood and the Shroud.* New York: The Free Press.

Rebuttal to Joe Nickell

RAYMOND N. ROGERS

Joe Nickell has attacked my scientific competence and honesty in his "Claims of Invalid 'Shroud' Radiocarbon Date Cut from Whole Cloth." Everything I have done investigating the shroud had the goal of testing some hypothesis [Schwalbe, L.A., Rogers, R.N., "Physics and Chemistry of the Shroud of Turin: Summary of the 1978 Investigation," *Analytica Chimica Acta* 135, 3 (1982); Rogers R. N., Arnoldi A., "The Shroud of Turin: an aminocarbonyl reaction (Maillard reaction) may explain the image formation," in *Melanoidins* vol. 4, Ames, J.M., ed., Office for Official Publications of the European Communities, Luxembourg, 2003, pp. 106–113].

My latest paper [Rogers, R. N., "Studies on the radiocarbon sample from the Shroud of Turin," *Thermochimica Acta* 425/1–2, 189–194 (2005)] is no exception. I accepted the radiocarbon results, and I believed that the "invisible reweave" claim was highly improbable. I used my samples to test it. One of the greatest embarrassments a scientist can face is to have to agree with the lunatic fringe. So, Joe, should I suppress the information, as Walter McCrone did the results from Mark Anderson, his own MOLE expert?

Incidentally, I knew Walter since the 1950s and had compared explosives data with him. I was the one who "commissioned" him to look at the samples that I took in Turin, when nobody else would trust him. I designed the sampling system and box, and I was the person who signed the paperwork in Turin so that I could hand-carry the samples back to the U.S. The officials in Turin and King Umberto would not allow Walter to touch the relic. Walter lied to me about how he would handle the samples, and he early ruined them for additional chemical tests. Incidentally, has anyone seen direct evidence that Walter found Madder on the cloth? I can refute almost every claim he made, and I debated the subject with his people at a Gordon Conference. I can present my evidence as photomicrographs of classical tests, spectra, and mass spectra.

Now Joe thinks I am a "Shroud of Turin devotee," a "pro-authenticity researcher," and incompetent at microanalysis. If he ever read any of my professional publications, he would know that I have international recognition as an expert on chemical kinetics. I have a medal for Exceptional Civilian Service from the U.S. Air Force, and I have developed many microanalytical methods. I was elected to be a Fellow of a national laboratory. A cloud still hangs over Walter with regard to the Vinland map. Joe does not take his job as "Research Director" very seriously. If he thinks I am a "true believer," I will put him solidly on the "far-right" lunatic fringe.

Joe did not understand the method or importance of the results of the pyrolysis/mass spectrometry analyses, and I doubt that he understands the fundamental science behind either visible/ultraviolet spectrometry or fluorescence. He certainly does not understand chemical kinetics. If he wants to argue my results, I suggest that we stick to observations, natural laws, and facts. I am a skeptic by nature, but I believe all skeptics should be held to the same ethical and scientific standards we require of others.

Raymond N. Rogers
Fellow (Retired)
University of California
Los Alamos National Laboratory
Los Alamos, New Mexico

Joe Nickell Replies:

Ray Rogers largely sidesteps my criticisms. He claimed to have uniquely found cotton and madder on the shroud's radiocarbon sample area—thus supposedly indicating it came from an "invisible reweave." He admits this scenario seemed "highly improbable," having come, he says, from "the lunatic fringe" (shroud zealots). He is unhappy that I disproved his claim by citing the earlier discovery, elsewhere on the cloth, of both cotton and madder.

Rogers now questions that Walter McCrone actually discovered madder on the cloth. If McCrone did not, how prescient of him to claim so, since its presence would be confirmed over two decades later by Rogers! Rogers's belated discovery follows the death in 2002 of McCrone, thus precluding his response.

I have not said Rogers was not a research chemist, rather that he is not an expert in the field of detecting art forgeries. Rogers's pro-shroud colleague, Alan Adler (whom Rogers cited in his report), admitted that McCrone "had over two decades of experience with this kind of problem and a worldwide reputation," whereas Adler conceded that he (and fellow researcher John Heller) "had never before tackled anything remotely like an artistic forgery." Apparently the same is true of Rogers. Why, then, were they chosen for such important work?

Having taught FBI and other forensic analysts, McCrone was termed "the best-known forensic microanalyst in the world" and his lab "the most completely equipped laboratory of its kind in this country or the world." Rogers himself once conceded McCrone was "the best in the world" in his highly specialized field.

Rogers claims "A cloud still hangs over Walter with regard to the Vinland Map." In fact, as shown on a *Nova* television program February 8, 2005, titled "The Viking Deception," McCrone's finding of a modern pigment, anatase, has been confirmed. Although McCrone's conclusions were once challenged by chemist Thomas Cahill and colleagues, in 2002 scientists using Raman microprobe spectroscopy proved that the Vinland Map's ink did contain anatase. (See Katherine L. Brown and Robin J.H. Clark, 2002, "Analysis of Pigmentary Materials on the Vinland Map and Tartar Relation by Raman Microprobe Spectroscopy," *Analytical Chemistry* 74 [15], 3658–3661.) With the Vinland Map as with the Shroud of Turin, apart from debates over sensitive tests, powerful historical and other evidence still strongly indicates forgery.

Regarding the rate of the shroud linen's vanillin loss, again Rogers is drawing doubtful conclusions from limited samples. Moreover, the results would have been affected not only by the fire of 1532 but also by the cloth's unknown storage conditions. This alternate linen dating "test" is not an accepted, proven one, but rather one newly improvised, and Rogers's conclusions are contradicted by much other evidence. As to the additional analyses Rogers refers to, please see McCrone's *Judgement Day for the Turin Shroud* (1996) and my *Inquest on the Shroud of Turin: Latest Scientific Findings* (1998).

* * *

Since writing the above, I am saddened to learn of Ray's death (on March 8). I know that he sincerely wanted to do good science, and I praised him in my book for backing away from his earlier position that the shroud image "was formed by a burst of radiant energy." He had the courage and integrity to distance himself from shroud zealots, and I know that on many other issues he and I would have been on the same side. □

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Second Sight: The Phenomenon of Eyeless Vision

Natasha Demkina claims a special ability: She can supposedly peer inside people's bodies, observe their organs, and diagnose malfunctions and disease ("The Girl" 2004; Baty 2004). For a Discovery Channel documentary, *The Girl with X-ray Eyes*, CSICOP was asked to test the Russian 17-year-old's alleged visionary abilities. (Results of the test, conducted in New York City on May 1, 2004, are presented elsewhere in this issue.) This column provides background and perspective on such claims.

Figures 1 and 2. The author dons an opaque blindfold, after it has been examined, followed by a black cloth hood. He then performs the celebrated "blindfold drive" feat—a supposed demonstration of "second sight." (Photographs by Robert H. van Outer)

Natasha's alleged ability falls under the heading of clairvoyance ("clear seeing"), also long known as "second sight." This is the purported perception of objects, people, or events—other than by the normal senses. It is thus a supposed form of extrasensory perception (ESP).

Mystics claim there are various states of clairvoyance, including two that are relevant to Natasha's claims. The first is X-ray clairvoyance, supposedly "the ability to see through opaque objects such as envelopes, containers, and walls to perceive what lies within or beyond." The other is medical clairvoyance, "the ability to see disease and illness in the human body, either by reading the aura or seeing the body as transparent" (Guiley 1991, 111–113). Needless to say, perhaps, as with other forms of ESP, neither of these alleged abilities has been scientifically verified. Let's look at each in turn.

Joe Nickell, CSICOP's Senior Research Fellow, is a former professional magician and author of numerous investigative books, including Real-Life X-Files.

X-Ray Clairvoyance

Demonstrations of X-ray clairvoyance date back many centuries, as do revelations that they could be accomplished by deception.

For example, in the sixteenth century, Reginald Scot explained how a trickster could use a confederate, or accomplice, to receive secret information. "By this means," he wrote in his classic treatise, *The Discoverie of Witchcraft* (1564), "If you have aine invention [that is, any inventiveness] you may seem to doo a hundreth miracles, and to discover the secrets of a mans thoughts or words spoken a far off."

Just such feats were being performed in 1831 by the "Double-sighted Phenomenon," an eight-year-old Scottish lad named Louis Gordon M'Kean. Blindfolded and facing away from the audience, the kilted youth readily identified watches, coins, snuffboxes, and the like. He could also repeat what others had spoken, even though they

whispered the words at a distance of a hundred yards (Nickell 1992, 70).

In the following decade came similar performances by an English woman known only as "the Mysterious Lady." She appeared at the Egyptian Hall in Picadilly in 1845 and also toured New England, where she apparently came to the attention of Nathaniel Hawthorne. He portrayed a strikingly similar clairvoyant, named "the Veiled Lady," in his 1850 novel, *The Blithedale Romance* (Dawes 1979, 147; Nickell 1991, 126–137).

A contemporary of "The Mysterious Lady" was Scotland's John Henry Anderson, styled the "Wizard of the North." In his magic act he featured his blindfolded daughter, billed as "the Second-Sighted Sybil." Anderson would leave the stage for this routine, going into the audience to select the objects for remote viewing (Dawes 1979, 110–111).

To thwart skeptics who might have guessed a prearranged code was used, some performers utilized a method in which not a single word was uttered. Such a version was employed in 1848 by the great French conjurer Robert-Houdin (from whom young Ehrich Weiss would later derive the name Houdini). He performed his *"La Second Vue"* (i.e., "Second Sight") with his young son, Emile. The boy's eyes were bandaged and his father merely rang a bell to indicate when an object was being held up for identification. There are many clever ways of accomplishing such a feat (Nickell 1992, 73–74).

The ability to see while apparently securely blindfolded is a magician's secret employed by many who lay claim to mysterious powers. One such alleged power is known variously as dermo-optical perception, paroptic vision, skin vision, or simply eyeless sight. Supposedly, this involves reading printed matter by means of the fingertips, divining colors by holding objects to the cheek, or similar demonstrations. The reputed phenomenon has appeared in various guises over the centuries, being associated, for example, with mesmerism in the 1840s.

Experimental work in both the United States and the Soviet Union in the 1960s sparked new interest in eyeless sight. For example, in 1962 a Soviet newspaper reported that Rosa Kuleshova, a twenty-two-year-old patient, could read with her middle finger and accurately describe magazine pictures. Before long, other Soviet women had discovered that they also possessed this amazing gift. Ninel Kulagina, a housewife in Leningrad, was not only able to read while blindfolded but could also propel small objects across a table, apparently by mere concentration (Christopher 1975, 77–86).

In the United States, *Life* magazine carried accounts of the Russian marvels in its issue of June 12, 1964. Years earlier, in its April 19, 1937, issue, *Life* had already featured the phenomenon of dermo-optical perception. At that time it was being demonstrated by a thirteen-year-old California lad named Pat Marquis, "the boy with the X-ray eyes."

Alas, each of the various X-ray wonders was soon discredited. Pat Marquis was tested by ESP pioneer J.B. Rhine and caught peeking down his nose. When the Soviet marvels were tested in ways that did not allow them to benefit from peeking, the remarkable phenomenon ceased.

As magicians know, it is difficult to prevent a determined trickster from peeking, since there are numerous means of making it possible. For example, one ten-year-old Soviet girl took advantage of her turned-up nose, which helped her to circumvent a pair of opaque goggles. As well, many circus entertainers, such as high-wire walkers, jugglers, knife throwers, and archers, have long employed trick blindfolds (Christopher 1975 81–86; Gardner 1987, 63–73).

Among the most famous of the eyeless-sight feats is the celebrated "blindfold drive," which has a long and colorful history. The "thought reader" Washington Irving Bishop (1856–1889) performed it with a horse-drawn carriage in the late 1880s, and many others followed suit. In modern times an automobile has been used. I have performed the feat myself, wearing an examined blindfold followed by a black cloth sack placed over the head and tied at the neck (see figures 1 and 2).

Laymen observing such feats often come up with imaginative theories to explain them. A British performer—only one in a long line of claimants to the title "The Man With the X-ray Eyes"—prompted several unique guesses when he drove a car around a farmyard. One observer opined that the alleged visionary had "fiber optics up his nose," another that he possessed "supersensitive hearing which detected the sound of squeaking mice hidden in straw bales." The actual secrets are far simpler (Nickell 1992, 69–80).

But what of a performer whose ability to perceive is limited neither by blindfolding nor shielding by solid metal? Such a "phenomenal mystifier"—as the Great Houdini called him—was Joaquin Maria Argamasilla, "the Spaniard with X-ray Eyes." He could tell time from a watch whose case was snapped shut or read a calling card or message locked in a box.

Houdini investigated the Spanish marvel in 1924. Noting first that Argamasilla used a simple blindfold and was obviously peeking, Houdini maneuvered into a position behind the mystifier that enabled him to peer over Argamasilla's shoulder. Houdini discovered that, upon receiving a watch, the Spaniard opened it a trifle under cover of a sweeping motion, and that the lid of the padlocked box allowed a corner to be raised slightly to permit a brief glimpse of the contents. Houdini offered a test by supplying two boxes, neither of which could be opened even slightly. He later wrote, "Argamasilla failed by refusal to make a test in both instances" (Gibson and Young 1953, 248–257).

Another X-ray clairvoyant appeared on *The Jerry Springer Show* in 1992, seeming to successfully divine the contents of a locked and guarded refrigerator. I was on the show as well and was suspicious of the whole performance. I challenged the marvel to a test of his ability using sealed envelopes, which he failed. Later, I analyzed a videotape of the fridge stunt. The descriptions of the various items were not *visually* accurate (for instance the psychic described a "carton" rather than a *jug* of milk) but only *cognitively* so—consistent with the hypothesis that the alleged clairvoyant had been tipped off as to the refrigerator's contents (Nickell 2001, 54–59).

To date, no one has demonstrated convincingly, under suitably controlled conditions, the existence of X-ray sight or any other form of clairvoyance or ESP.

Medical Clairvoyance

The other type of alleged clairvoyance that is relevant to the Girl with X-ray Eyes is medical intuition, a resurgent pseudoscientific fad based on so-called "energy medicine." It involves psychically divining people's illnesses and, often, recommending treatment.

The approach is as ancient as it is primitive, being akin to the magical, divinatory efforts of the shaman, medicine man, or witch doctor, or the practice of astrological medicine in the Middle Ages (Porter 1997, 14, 25). A forerunner of modern spiritualists, Andrew Jackson Davis (1826–1910) was known as the "Poughkeepsie Seer" for diagnosing illnesses while in a supposed mesmeric trance. Another was Antoinette (Mrs. J.H.R.) Matteson (1847–1913), a "clairvoyant doctress" and spiritualist who, suitably self-entranced, divined formulas for her custom-bottled "Clairvoyant Remedies" (Nickell 2004).

The most famous medical clairvoyant was "Sleeping Prophet" Edgar Cayce (1877–1945) who gave diagnostic and prescriptive readings while supposedly hypnotized. His early studies of osteopathy, homeopathy, and other quaint theories of healings influenced his approach, and in addition to osteopathic manipulations he prescribed electrical treatments, special diets, and various strange remedies. According to Martin Gardner (1957, 218) these included such medicines as "oil of smoke" (to treat a leg sore), "peach-tree poultice" (for a baby's convulsions), and "bedbug juice" (to treat dropsy).

Cayce's touted successes at diagnosis and treatment are not surprising. He was obviously aided in his diagnoses by the letters he received usually containing specific details about the illnesses for which readings were sought. Moreover, Cayce's responses were laced with such expressions as "perhaps" and "I feel that," as he avoided positive declarations. Even so, sometimes he gave his supposedly psychic diagnoses for persons who had already died! (Randi 1982, 189–192)

As to Cayce's supposedly successful treatments, they seem nothing more than those often claimed by "alternative" medical practices including faith healing. Successes may simply be due to the body's natural healing ability, the spontaneous remission of some conditions, the placebo effect, delayed results of prior medical intervention, and other factors, including misdiagnosis and selective reporting of positive outcomes. (The dead do not give testimonials. See Nickell 1998, 131–166.)

In recent years, the practice of medical clairvoyance gained new impetus from some popular books. One, published in 1996, was *Second Sight*, written by Judith Orloff, M.D., a psychiatrist who fancies she has psychic abilities. Another book was the 1997 best-selling *Why People Don't Heal and How They Can*, by Caroline Myss, "who has a background in theology" (Koontz 2000, 102). As is typical of other self-styled "medical intuitives," Orloff and Myss have many of the traits associated with a fantasy-prone personality (Nickell 2004, 214–216).

Girl with X-ray Eyes

Natasha Demkina's claimed ability combines features of both X-ray clairvoyance and medical clairvoyance. I find it a curious admixture.

For example, she declined my suggestion that she attempt to identify simple, easily recognizable objects—such as a pair of scissors—merely placed inside my sport coat. I thought this a far easier and potentially less ambiguous test than having to look through both clothing and flesh and trying to identify subtle alterations in organs. However, she told me (through a translator) that—inexplicably—she could only "see" through living tissue, leaving me to wonder if some of her touted successes were not dependent on the ambiguity that necessarily resulted from such a descriptive process.

On the other hand, while a few medical intuitives purport to see the body as transparent, most do not, instead claiming to get their knowledge by reading the subject's "aura" or by some other—even more remote—means. (Some nineteenth-century practitioners had curious techniques: one offered "Medical Diagnosis by Lock of Hair," while another worked via his "Spirit-Physicians" [*Medium* 1975].)

Natasha's claimed power, then, is rather distinctive, but it also seems nonexistent. In Britain she appeared on ITV's *This Morning* and, at first, impressed the program's resident physician, Chris Steele, saying he might have problems with his stomach, liver, pancreas, and kidneys; however, subsequent medical tests revealed Natasha's claims to be erroneous. For the results of her CSICOP test, see the accompanying articles by Ray Hyman (pp. 27–33) and Andrew Skolnick (pp. 34–37).

References

Baty, Phil. 2004. Scientists fail to see eye to eye over girl's "x-ray vision." *Times Higher Education Supplement*, December 10.

Christopher, Milbourne. 1975. *Mediums, Mystics & the Occult*. New York: Thomas Y. Crowell.

Dawes, Edwin A. 1979. *The Great Illusionists*. Secaucus, N.J.: Chartwell Books.

Gardner, Martin. 1957. *Fads and Fallacies in the Name of Science*. New York: Dover.

———. 1987. *Science: Good, Bad & Bogus*. Buffalo, N.Y.: Prometheus Books.

Gibson, Walter B., and Morriss N. Young, eds. 1953. *Houdini on Magic*. New York: Dover.

The Girl with the X-ray eyes. 2004. *Fortean Times* 182 (May), 4–5.

Guiley, Rosemary Ellen. 1991. *Harper's Encyclopedia of Mystical and Paranormal Experience*. New York: Harper Collins.

Koontz, Katy. 2000. The new health detectives. *New Age* (January/February): 64–66, 102–110.

The Medium and Daybreak. 1875. London, 13 August, 527.

Myss, Caroline. 1997. *Why People Don't Heal and How They Can*. New York: Harmony Books.

Nickell, Joe. 1991. *Ambrose Bierce Is Missing and Other Historical Mysteries*. Lexington, Ky.: University Press of Kentucky.

———. 1992. *Mysterious Realms*. Buffalo, N.Y.: Prometheus Books.

———. 1998. *Looking for a Miracle: Weeping Icons, Relics, Stigmata, Visions & Healing Cures*. Amherst, N.Y.: Prometheus Books.

———. 2001. *Real-Life X-Files*. Lexington, Ky.: University Press of Kentucky.

———. 2004. *The Mystery Chronicles: More Real-Life X-Files*. Lexington, Ky.: University Press of Kentucky.

Orloff, Judith. 1996. *Second Sight*. New York: Warner Books.

Porter, Roy. 1997. *Medicine: A History of Healing*. New York: Barnes & Noble.

Randi, James. 1982. *Flim-Flam!* Buffalo, N.Y.: Prometheus Books.

Scot, Reginald. 1564. *The Discoverie of Witchcraft*. Reprinted (from an English edition of 1930) New York: Dover, 1972, 191. □

The So-called Gaia Hypothesis

Is Earth a living organism? Broadly speaking, this is the chief claim of a family of ecological theories often referred to as "Gaia" (from the Greek goddess of the earth). The idea was proposed in the 1960s by atmospheric scientist James Lovelock, and elaborated in the early 1970s by him in collaboration with biologist Lynn Margulis (author of the widely accepted theory that many subcellular organelles, like mitochondria and chloroplasts, were once living organisms that began a symbiotic relationship with other cells). The Gaia hypothesis is often taught in mainstream college-level courses in ecology, despite being a hopeless mix of pseudoscience, bad science, and mysticism. It therefore provides an ideal topic of discussion for this column, with our focus on how science works and what distinguishes science from pseudoscience.

One reason the theory is slippery and difficult to address is because there are several forms of it, with claims ranging from the trivial and uncontroversial (the Earth is a complex system with positive and negative feedback loops) to complete nonsense (Earth is a sentient and conscious being whose purpose is to keep life thriving). Lovelock and Margulis's original version was closer to the nonsense end of the spectrum. For example, Lovelock wrote that Gaia is a cybernetic system "which seeks an optimal physical and chemical environment for life on this planet" (quoted at http://en.wikipedia.org—a good, neutral introduction to the theory and controversy); or consider this statement: "Earth's atmosphere is more than merely anomalous; it appears to be a contrivance specifically constituted for a set of purposes" (Lovelock and Margulis 1974, source as above). Notice the reference to Gaia "seeking" an end-result, or it being "a contrivance," with the clear implication of purpose. In response to harsh criticism in this regard, Lovelock and Margulis later retreated to a less controversial (but, alas, less interesting) position, even denying any previous intention to attribute purpose to Gaia: "Nowhere in our writings do we express the idea that planetary self-regulation is purposeful, or involves foresight or planning by the biota" (1990, source as above).

Regardless, is there anything scientifically interesting in any version of the Gaia hypothesis? Let us consider two fundamental components of the theory: the idea that Earth is a complex system characterized by feedback loops; and the idea that the planet is, in some interesting sense, akin to a living organism. I will leave out of this discussion the most nonsensical member of the Gaia family of hypotheses, one claiming that the planet is a conscious being whose purpose is to keep life safe and sound. Notice, however, that it is something like the latter version that is thriving at the margin of academic circles and in the popular media, fueling mystical and New Age "thought" about "mother Earth" and other such pseudoscientific concepts. Given some of the quotes reported above, I think it is fair to hold Lovelock and Margulis at least partially responsible for yet another form of sloppy thinking and poor scientific literacy among the general public. Oh well.

Back to the first component of the Gaia hypothesis: Earth seen as a complex system with feedbacks. Lovelock developed a simple (some would say simplistic) computer simulation to make the point: his "Daisyworld" explores what would happen on a planet with just two life forms, light daisies and dark daisies. The former ones reflect light (and cool the atmosphere), the latter ones absorb light (and warm up the atmosphere). The main result of the model is that, in response to a gradual increase of luminosity by the sun (a phenomenon that actually happened during the history of life on Earth) the population of daisies adjusts the frequency

THE SO-CALLED GAIA HYPOTHESIS
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There's a UFO in My Painting!

"UFOs are not a recent invention, they were seen by our ancestors as well!" This is one of the typical claims that can be found in books by Erich Von Däniken, Peter Kolosimo, and similar authors. The proof for it? A variety of strange objects depicted in paintings by some of the world's greatest artists.

The Madonna's Spaceship

A typical example is the *Madonna con Bambino e San Giovannino* (*Madonna and Child with the Infant Saint John*) attributed to Sebastiano Mainardi or Jacopo del Sellaio. The painting is from the end of the fifteenth century and is now on display in the Sala d'Ercole in Palazzo Vecchio, Florence. Examining it, we see in the upper background, behind the Madonna, a strange oval shape suspended in the sky. Some UFOlogists describe it as "an airborne object, leaden in color, inclined to port, sporting a 'dome' or 'turret,' apparently identifiable as an oval-shaped moving flying device."

Carlo Crivelli's *Annunciazione* (*Annunciation*).

In order to understand what this and other ancient paintings really portrayed, however, it is essential to learn how ancient artists really worked. "Not one of those that see UFOs in paintings," says Italian art expert Diego Cuoghi, "ever tries to understand the real symbolical meanings of those strange things in the art of that period, and so they take them as realistic depictions of unidentified flying objects seen live."

The object in Mainardi's painting is a "radiant cloud." "In those times," says Cuoghi, "the subjects for paintings were almost exclusively of a religious nature and, in the case of the 'adorations,' like Mainardi's, there often appeared in the sky an angel or, as some apocryphal Gospels have it, a radiant cloud. Another example of this kind is in the *Nativity of Lorenzo Monaco*."

The little man on the right of the painting that shields his eyes looking at the sky is another typical element of such paintings. However, that man does not appear to look at the radiant cloud, but at the Nativity Star and three other small stars (or flames) to the far left, a symbol of the "trifold virginity" of the Madonna (before, during, and after the virgin birth).

Crivelli's UFOs

In Carlo Crivelli's *Annunciazione* (*Annunciation*), a 1486 painting now on display at the National Gallery in London, some believe that a UFO is in the sky and that from it a ray of light comes down to touch the head of the Virgin Mary. All mystery mongering prints of this painting show poor-quality reproductions of the details. However, it would be enough to visit the gallery or look at a better print of the painting to see that it is not a UFO at all. "It's a vortex of angels in the clouds," says Cuoghi, "a very common artistic device used to represent the presence of God, and it can be seen in many Medieval and Renaissance religious paintings, like in Correggio's fresco at the Dome of Parma or in Gustave Doré's engraving of Canto XXI from Dante's *Paradiso* from his *The Divine Comedy*, but above all in most Anunciations and Baptisms of the Christ."

Another Crivelli painting, the *Madonna con Bambino* (*Madonna with Child*) at the Pinacoteca of Ancona, is believed by some to show "objects very

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similar to modern nuclear missiles ready to launch"!

Those making such claims, however, never take the time to research the life of the artist, his work, or the place where the painting was originally displayed. It would be enough to compare this with other paintings by the same artist, in fact, to establish that the "missiles" are actually towers and bell towers, like those that appear in almost all of Crivelli's paintings.

Another example is the famous Mayan bas-relief that Von Däniken and others believed represented an astronaut, but was actually a depiction of Pakal, the Maya king. One cannot simply give a modern interpretation to events and depictions outside of their original context.

God's Sputnik

The *Santissima Trinità* (*Holy Trinity*) by Bonaventura Salimbeni (1595), now a St. Peter's Basilica at Montalcino, is one of the most famous "UFOs" in a painting. The mysterious "spherical object with antennae" that appears between Christ and God has frequently been referred to as "Montalcino's Sputnik," due to his similarity in appearance to the old Soviet satellites.

In truth, the globe represents Creation, with the Sun on top and the Moon below left (some interpreted it as the periscope of the satellite!). The "antennae" are actually two sceptres held by Christ and God.

The same kind of astronomical illustration on the Globe of Creation can be found in a painting by Pieter Coecke, depicting the Trinity and now on display at Prado's Musem in Madrid. Here as well it is possible to see the Sun, the Earth, with the cone of shade, and the Moon, smaller, down below.

"The representations of Sun and Moon" continues Diego Cuoghi "have frequently misled some UFOlogists who have completely misunderstood their meaning. The majority of the crucifixion paintings and mosaics done in the Byzantine style, for example, show the same odd 'objects' on either side of the cross, the Sun and the Moon, and they are often represented with a human face or figure."

An example of this is the sixteenth-century fresco *Crucifixion of Christ* located on the wall of the Visoki Decani Monastery in Kosovo, Yugoslavia. Some did interpret the Sun and the Moon as "spaceships with a crew." "Only those that are unfamiliar with artistic symbology of the time," says Cuoghi, "can claim that these are mysterious elements."

The Flying Hat

In Paolo Uccello's *Tebaide* (also known as *Scene di Vita Ermetica*, or *Scenes of Monastic Life*), now at the Gallerie dell'Accademia, in Florence, some claim to see "a saucer object, suspended in the air and surmounted by a red domed top. Red in color, the object comes out over the dark background by contrast. The dynamic movement of the flying object is rendered by means of light brush strokes, again red in color, which provide the effect of a sudden turn."

One can't help but smile at such a description. When viewing the whole painting (not just a close up of the red object) it is quite clear that the object is located inside a cave, on the ground beneath the crucifixion, and that it represents a large red hat belonging to St. Jerome, who is seen praying before the crucified Christ.

The first one to write about St. Jerome was Giovanni di Andrea of Bologna, and in his writings legend overruled historical truth. The same author gave precise details on how artists had to depict the Saint: "Cum capello, quo nun cardinales utuntur, deposito, et leone mansueto" ("With hat, of the kind still in vogue for cardinals, placed on the ground, and with meek lion.") The hat in question is present in various representations of the Saint.

UFO Invasion

There are two other famous paintings where flying saucers are said to be represented. One is the *Baptism of Christ* by Aert DeGelder, now at the Fitzwilliam Museum in Cambridge. In this painting, a UFO seems to light from above the scene of Christ's baptism. Actually, the "thing" in the sky is not a flying saucer but a circle of light with a dove inside, a typical representation for the Holy Spirit. The scene reproduces exactly the description in the Gospels and is also represented in the same way in other paintings of the time.

The other UFOlogical painting is the *Miracolo della neve* (*Miracle of the Snow*) by Masolino Da Panicale, painted in 1428 and on display at the Museo Nazionale di Capodimonte, Naples. Here the mystery mongers claim to see "a UFO invasion" in the clouds above the scene. But those lenticular clouds are not infrequent subjects in the artworks of the fifteenth century. "It is a nonrealistic way to represent clouds," says Cuoghi, "such non-realism was seen in the sacred art of the first half of the fifteenth century." As for the event depicted in the painting, a snowfall in August, it can certainly be seen as an extraordinary event, but not an impossible one. Exceptional atmospheric events of this kind are sometimes recorded in Italy. Unseasonal snow, for example, took place on the seaside of Calabria on May 12, 1755; in Lunigiana on July 1, 1756, in Bologna on June 1, 1481; and recently in Prato on August 5, 2000. The memory of such an extraordinary events might easily be handed down through the centuries, gaining details and particulars and being transformed into the "miracle of the snow."

Aliens Everywhere!

"The method used by so-called UFO hunters," concludes Cuoghi, "requires no knowledge whatsoever on the history of art. What you need is just to pick up a book with reproduction of paintings, better if painted before the seventeenth century, and try to find any little object that may have a lenticular shape. This way, you will find no difficulty at all in locating elements that may appear bizarre and out of place. Now, you only need to claim that these objects are inconsistent to the time, place, or context of the artwork, and so you can certainly term them as 'alien' or 'unidentified.' And so, you can now call yourself an 'ancient UFOs' expert!"

Reference

A detailed study by Diego Cuoghi on UFOs in ancient paintings can be found at www.sprezzatura.it/Arte/Arte_UFO_eng.htm. □

Tsunami Conspiracies and Hollow Moons

Almost as soon as the scope of the destruction became clear from the recent tragic tsunami that devastated much of coastal southern Asia, claims began to surface of strange events associated with it. Humans are pattern-seekers, and to many it seems impossible that an event so awesome and destructive could occur without at least some violation of the natural order, no matter how small.

One of the first survivors of the disaster to return to Britain, nurse Debbie Bates, told the *Daily Record* (December 28, 2004), "'I saw a palmist the day before [in Sri Lanka]. He said, 'Stay out of the sea, big wave coming.' At the time, I thought it was a joke—now I just think it is freaky." Unfortunately, we don't know how many thousands of people may have received that same warning for days on which nothing unusual happened. Indeed, given the popular custom of visiting fortune-tellers in Thailand and other Asian countries, it seems remarkable that there was anyone left unwarned, unless the prognosticators themselves were equally in the dark. Meanwhile, a prominent Thai fortune teller blamed the tsunami on the "bad luck" of Prime Minister Thaksin Shinawatra. Pinyo Pongcharoen, president of the International Astrology Association, said that Thailand's astrological sign was already under the adverse influence of four ill-omened stars and, worse yet, one of the stars was further aggravated by malicious influence from Thaksin's astrological sign (*The Nation,* Bangkok, December 28).

People from a nearby camp for the displaced bathe in a river January 26, 2005, in the tsunami-ravaged town of Meulaboh, Indonesia. (Photo by Spencer Platt/Getty Images)

Once the tizzy over the mostly clueless fortune-tellers died down, media outlets were rushing to report how animals seemed to have a "sixth sense" causing most of them to avoid the coming tsunami. H.D. Ratnayake, deputy director of Sri Lanka's Wildlife Department, told Reuters, "No elephants are dead, not even a dead hare or rabbit. I think animals can sense disaster. They have a sixth sense. They know when things are happening." Even the *National Geographic News* was reporting (January 4) anecdotes of how "elephants screamed and ran for higher ground" and "Dogs refused to go outdoors." What is usually not mentioned is that the tsunami was preceded by an extremely powerful earthquake, capable of alarming both man and beast. Furthermore, it does not appear to be the case that wild animals cluster along the ocean's open shore in the same manner that humans do—they usually

Robert Sheaffer's World Wide Web page for UFOs and other skeptical subjects is at www.debunker.com.

prefer to remain hidden in the relative safety of the forest.

Lynette Hart, an animal researcher at the University of California—Davis, explained to the *Sacramento Bee* (January 14) that many animals are exquisitely sensitive to sounds and to vibrations in the ground. "It may only take one antelope becoming frightened by sensory changes to communicate, 'Let's get out of here,' and they all go." Andy Michael, a geophysicist at the U.S. Geological Survey, told *National Geographic*, "What we're faced with is a lot of anecdotes. Animals react to so many things—being hungry, defending their territories, mating, predators—so it's hard to have a controlled study to get that advanced warning signal."

Next, just as predictably, the conspiracy theories began to emerge (these usually don't surface immediately, as it takes a while to cook them up). The Egyptian Nationalist weekly *Al-Usbu* published an investigative report by Mahmoud Bakri on January 1. In it he suggests that the earthquake and tsunami were a consequence of secret nuclear testing by the U.S., Israel, and India: "The three most recent tests appeared to be genuine American and Israeli preparations to act together with India to test a way to liquidate humanity. In the[ir] most recent test, they began destroying entire cities over extensive areas. Although the nuclear explosions were carried out in desert lands, tens of thousands of kilometers away from populated areas, they had a direct effect on these areas." These alleged nuclear tests "destabilized the tectonic plates," leading to disaster. A (possibly fictitious) American scientist was quoted saying "the center of an earthquake that took place some forty kilometers under the ocean floor could not have caused such destruction unless nuclear testing had been conducted close to the tectonic plates in these countries, or unless several days previously there had been [nuclear] activity that caused these plates to shift and collide." A Saudi professor attributed the tragedy to divine retribution for homosexuality and fornication, while various religious leaders warned that it was caused by corruption, the presence of infidels, and other sins (see http://memri.org/bin/articles.cgi?Page=archives&Area=sd&ID=SP84205).

Abd Al-Baset Al-Sayyed of the Egyptian National Research Center said in an interview on Al-Majd TV on January 16 that NASA had discovered that Earth is emitting short-wave radiation. "When they discovered this radiation, they started to zoom in, and they found that it emanates from Mecca—and, to be precise, from the Ka'ba" (see www.memritv.org/Transcript.asp?P1=545). What's more, they found that the radiation was "infinite." NASA found that the radiation extends well past Mars, apparently extending to "the celestial Ka'ba," effectively connecting heaven and earth. NASA, says Al-Sayyed, had this information on their Web site for twenty-one days, but then took it down, apparently as part of yet another cover-up of amazing findings in outer space.

* * *

Speaking of NASA, the recent, highly successful Cassini mission to Saturn has returned a wealth of scientific data, especially the Huygens probe that landed on Saturn's moon Titan, the first such landing on a planetary satellite other than our own Moon. However, NASA conspiracy theorist Richard Hoagland, the chief promoter of the "Face on Mars," claims he has made dramatic discoveries from its photos, not of Titan, but instead of Saturn's moon Iapetus, an unusual body having one relatively dark hemisphere and one lighter:

> In our opinion, Cassini's discovery of "the Great Wall of Iapetus" now forces serious reconsideration of a range of staggering possibilities . . . that some will most *certainly* find upsetting: it could really *be* a "wall" . . . a vast, planet spanning, *artificial* construct!! . . . There is no viable geological model to explain a *sixty thousand-foot-high, sixty thousand-foot-wide, four million-foot-long* "wall" . . . spanning *an entire planetary hemisphere*—let alone, located in the *precise plane* of its equator! (See www.enterprisemission.com/moon1.htm.)

Hoagland has further discovered that some of Iapetus's craters appear to be somewhat "square," and are allegedly lined up along north-south, east-west lines: "Clearly these are *not* random, 'square craters'—but remarkable, highly ordered evidence of sophisticated, aligned, repeating *architectural* relief! . . . The impression of a vast set of extremely ancient *ruins*—most now without roofs, but with ample surviving walls—covered both by 'snow' . . . and whatever the 'brown stuff' is . . . is unavoidable."

Stressing the near-impossibility of these structures being built by living creatures on the surface of a cold, airless, waterless world, Hoagland leaps to a conclusion that presupposes an even greater engineering impossibility: "what if Iapetus is *not* a natural satellite at all . . . but a 900-mile wide *spacecraft*—an *artificial* 'moon?!'." He suggests that Iapetus was assembled millions of years ago by some alien intelligence using the principles of Buckminster Fuller's geodesic domes, and that many of the craters are in fact "deformed hexagons," where the moon's surface is collapsing from eons of meteoritic erosion, revealing the underlying hexagonal supports. My brief summary cannot possibly do justice to the zaniness of Hoagland's "hollow Iapetus" theory—you need to read the original on his Web site.

It is telling that Hoagland does not discuss the problem that his "hollow Iapetus" theory poses in accounting for that moon's measured mean density of about 1.21 grams per cubic centimeter, less than our own moon's but greater than that of Saturn. This is perplexing, since he begins the piece arguing that Iapetus's relatively low density and slow rotation means that the centrifugal force at the equator would be extremely small. It's too bad that Hoagland didn't follow through and give us any calculations designed to show how it would be possible for an essentially hollow sphere to have a mean density greater than that of water. He must have realized the fatal flaw this calculation would pose for his wild assertion, which is why he avoids the subject.

A NASA Web site notes: "Cassini's next close encounter with Iapetus will occur in September 2007. The resolution of images from that flyby should be 100 times better than the

ones currently being analyzed. The hope is that the increased detail may shed light on Iapetus's amazing features and the question of whether it has been volcanically active in the past" (see www.nasa.gov/mission_pages/cassini/media/cassini-010705.html). Until then, we can only wonder what Hoagland's amazing "artificial structures"—which, like all allegedly anomalous objects photographed, are near the limit of resolution of the cameras—will look like with one hundred times finer detail revealed.

* * *

Last December 8 *The Telegraph* of London carried an item written by Uri Geller, the noted Israeli-born spoon bender, about an "alien egg" allegedly given to him by the late John Lennon. According to Geller, he, Lennon, and Lennon's wife Yoko Ono were having dinner in a New York restaurant one evening when Lennon surprised him with the following account:

> About six months ago, I was asleep in my bed, with Yoko, at home, in the Dakota Building. And suddenly, I wasn't asleep. Because there was this blazing light round the door. It was shining through the cracks and the keyhole, like someone was out there with searchlights, or the apartment was on fire. . . . There were these four people out there. . . . They were, like, little. Bug-like. Big bug eyes and little bug mouths and they were scuttling at me like roaches . . . I tried to throw them out, but, when I took a step towards them, they kind of pushed me back. I mean, they didn't touch me. It was like they just willed me. Pushed me with willpower and telepathy. (See www.telegraph.co.uk/arts/main.jhtml?xml=/arts/2004/12/08/ftgeller08.xm.)

Today, "insectoid" aliens play a significant role in many stories of UFO abductions, which was not the case when Lennon allegedly related this account. So either John Lennon was a pioneering "experiencer" of a now-common alien encounter, or else Geller made up this story long after Lennon's death.

The next thing that Lennon could reportedly remember, he was back in bed with Yoko, left holding a smooth, metallic egg-like object he subsequently gave to Geller in the hopes that Uri could figure it out. Says Geller, "I have a strong sensation that John knew more about this object than he told me. Maybe it didn't come with an instruction manual, but I think John knew what it was for. And whatever that purpose was—communication? Healing? A first-class intergalactic ticket?—it scared him." Yet despite all the hype, Geller seems to have made no attempt to initiate any serious scientific analysis of his potentially miraculous "egg." □

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of the two types, and the overall temperature of the planet remains constant (and favorable to the survival of the daisies).

While this is interesting, it is also not particularly surprising. Self-regulatory systems (more complex than Daisyworld) are well known to ecologists and planetary scientists, and they are fairly well understood in their mechanics. Moreover, a related claim that Daisyworld shows that self-regulating behavior can emerge without selection is simply false: the population of light and dark daisies *evolves* to adjust its own frequency and *co-evolves* with the environment in which the daisies live (incidentally, the coevolution of organisms and their environment isn't a new idea either). The simulation doesn't superficially look like biological evolution only because the underlying genetics of the system has been subsumed in the structure of the equations defining the model, but evolution occurs nonetheless. And it is evolution (by natural selection) that is the only known mechanism that produces complex self-regulation in living organisms.

More important, even if we grant that Daisyworld tells us something interesting about self-regulatory systems, it does not follow that we can jump to the second, more interesting and controversial, claim of the Gaia theory: that Earth itself is in any meaningful sense a living organism. First, we know of clearly nonliving systems that achieve self-regulation. For example, the classical studies by Ilya Prigogine on nonequilibrium thermodynamics and emergent complexity have shown how sets of chemical reactions (e.g., the Belousov-Zhabotinskii reaction) can achieve stable, self-regulating equilibria, just like living organisms. Yet nobody in his right mind would suggest that a Belousov-Zhabotinskii system *is* a living being!

Second, and most important, Lovelock and Margulis seem to be missing the obvious mark, as pointed out by Richard Dawkins in an early critique of the Gaia hypothesis (back in 1983): Living organisms, as we understand them, are entities capable of much more than just metabolism and homeostasis (self-regulated equilibrium). They are capable of *evolving by differential reproduction.* No reproduction, no evolution, no living being; and the last time I checked there aren't any baby Earths out there in the process of populating the solar system. . . .

But, one could object, Gaia is just a metaphor, aren't the critics being a bit too harsh about it? Yes and no. Yes, Gaia is a metaphor, and science cannot do without metaphors. But no, the criticisms have not been too harsh because metaphors have to *do some work* in order to be beneficial in science. Thinking of Earth as a living organism doesn't do any useful work, in the sense that it doesn't generate any new insight or testable hypotheses about emergent systems or ecosystem ecology (Daisyworld isn't a new way of thinking about self-emergence, and it doesn't make predictions that can be empirically tested). On the contrary, Gaia seems to have done mostly negative work, in the sense of having encouraged sloppy thinking about what living beings are and how they work, as well as what sort of system our planet really is. So, please let Greek gods and goddesses rest in peace on Mount Olympus, and let us get back to developing a much-needed real science of planetary ecology. □

Testing Natasha

Can a seventeen-year-old girl truly "see" inside a person's body? Ray Hyman and colleagues conducted tests to search for the truth inside The Girl with X-Ray Eyes.

RAY HYMAN

Our assignment might seem straightforward. A seventeen-year-old Russian girl, Natasha Demkina, says she can look at people and "see" the status of their internal organs. The Discovery Channel asked Richard Wiseman, Andrew Skolnick, and me to test her claim for their television program, *The Girl with X-ray Eyes.* You might think that testing Natasha's claims would be routine. The test of a psychic claim, however, is rarely cut-and-dried. Most such claims do have much in common. Each also offers unique challenges. We had to conduct the test of Natasha's claim to fit the constraints of a television program. We had only a month to devise a protocol that would be acceptable to all parties. After everyone agreed to the

procedure, we had less than a week to locate a testing site in New York City and to find seven willing and suitable test subjects.[1]

The Claim and Its Support

Monica Garnsey, director and producer of the program, told us how Natasha operates and what she claimed to do. Many news sources and reports on the Internet described her accomplishments. (This information was consistent with what we observed when Natasha diagnosed volunteers at the Open Center in New York City the day before the test.) Garnsey e-mailed us the following information from Russia, where she was taping material for the television program:

> I double-checked a few things with her last night. Since the age of ten, a few days after having a religious dream, and also having had an operation to have her appendix removed that went wrong, swabs were left in her and she had to have another operation, Natasha has claimed to be able to see into people. . . . Natasha can see through clothing, but not see what someone is holding behind their back. She cannot see inside people if she shuts her eyes. Daylight is better. She does not need to talk to them to diagnose. She can also diagnose from a photograph. She usually scans people all over first, by making them stand up fully clothed and looking them up and down; delivers a general diagnosis; and then goes into more detail when the patients have discussed their concerns with her. She says she can *certainly* see ribs, heart, lungs, initially in general "like in an anatomy book," but can see right down to the cell level if she concentrates. She says that she can examine the whole body, but it can give her a bad headache if she does too much. The idea of restricting the test to the chest area appeals [to her], though her claims extend further than that.

Natasha's story is like thousands of other accounts. Alleged psychics and their supporters make claims that, if true, defy the physical limitations and laws of modern science. The proponents support the reality of these claims with testimonials of outstanding successes. They argue for the reality of the claim passionately and unreservedly. Although some proponents have had scientific training, none of the supporting evidence comes from well-controlled scientific studies.

In the long history of psychical research, not one of these claims has produced convincing scientific evidence for the existence of paranormal ability (see Joe Nickell's column in this issue, p. 18). A few researchers have claimed that they did have scientific proof for a paranormal claim. Scrutiny by other scientists, however, showed that the "scientific proof" had serious flaws. Furthermore, none of these claims could be independently replicated.

The evidence supporting Natasha's abilities comes from selected anecdotes of reactions to her readings. No matter how subjectively compelling, the context of such readings makes it impossible to separate how much of the apparent success is due to such possibilities as: guessing; external clues from the client's physical appearance and observable behavior; feedback from the client's spoken and bodily reactions; or actual paranormal powers. A meaningful test would allow Natasha to show her powers and, simultaneously, control for guessing and the use of normal sensory clues.

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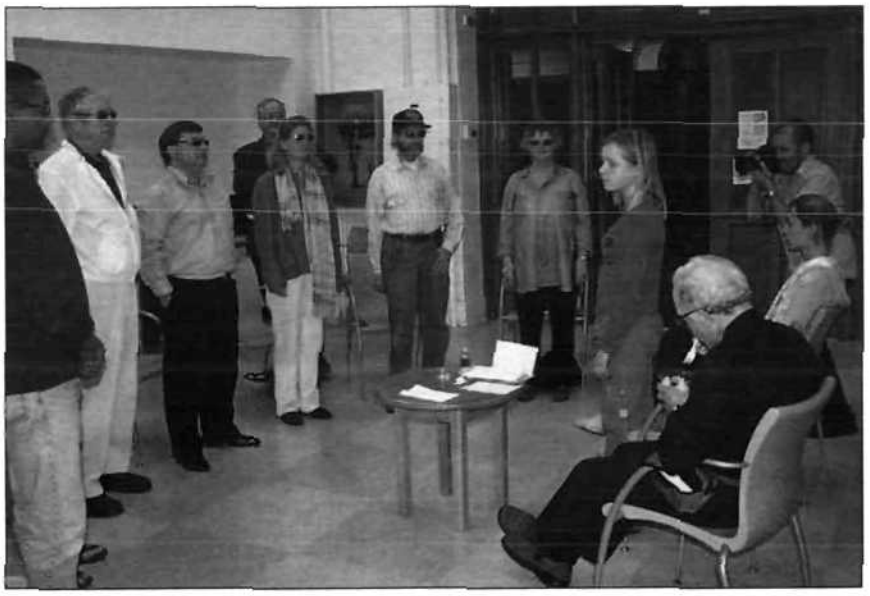
Natasha Demkina poses for photographs after being tested by CSICOP and CSMMH for the Discovery Channel program *The Girl with X-ray Eyes*. Her friend, Svetlana Skarbo, who acted as her translator, holds a cell phone over which they had sent and received text messages to unknown parties during the test (in violation of test protocols). On the left is Barrie Cassileth, Ph.D., Chief of Integrative Medicine Services at Memorial Sloan-Kettering Cancer Center, who helped to recruit subjects for this preliminary study. Photo credit: Andrew A. Skolnick.

Problems With Testimonial Support of Natasha's Claims

The stories told by Natasha's proponents are consistent with her having X-ray vision. This does not show that she does have X-ray vision because the same stories are consistent with many other alternatives. Two possibilities are the following: 1) her statements have no connection with the client's condition but appear to do so because of luck, selective reporting, and/or other reasons that I will discuss; or 2) her statements accurately reflect the subject's condition, but this information comes through normal means such as the subject's appearance and behavior. Consider, first, the ways that her statements can falsely appear to describe the patient's condition.



For Discovery Channel publicity photos following CSICOP-CSMMH's test, Natasha Demkina examines the seven volunteer test subjects. The subjects are wearing opaque glasses to prevent communication through eye movement. The head test proctor, Ray Hyman, is sitting in the bottom right corner. Photo credit: Andrew A. Skolnick.

She Might Have No Knowledge About the Client's Condition But Get Credit Anyway

Natasha has been giving readings to a steady flow of clients for more than six years. By now the number of such readings is huge. Her supporters naturally emphasize the most striking examples of apparent hits. The number of diseases and internal parts that could be defective is limited. Some conditions, such as cancer and heart problems, are more common than others. We should expect that her supporters will find some examples of "correct" diagnoses. With so many diagnoses, a certain number will match the client's condition just by chance.

To evaluate a diagnostic procedure properly we need to clearly decide what is a "hit" and what is a "miss." Most important, we should set the criteria before we know the outcome. In Natasha's readings, no clear and objective standards were ever established. This allows for her generally vague utterances to be retrofitted to what the client or observer knows to be true. An example of such retrofitting occurred when Natasha was doing a reading in London. Dr. Chris Steele, described by *The Daily Mail* (January 29, 2004) as one of her champions, was observing. The newspaper quotes him as saying, "Natasha doesn't know any medical terms at the moment. With one person this week she was trying to describe a kidney stone, and her translator came up with the words, 'sand' and 'gravel' before I suggested stones. When kidney stones start off, they do look like sand." Dr. Steele gives her credit for correctly diagnosing kidney stones. Yet we have no idea what Natasha was "seeing" or what she had in mind. Dr. Steele made the medical diagnosis, not Natasha.

Other features of Natasha's readings foster the illusion of accuracy. When she tells clients something that agrees with previous medical diagnoses, they credit her with a hit. Similarly, when she tells the clients something that *disagrees* with previous medical diagnoses, they still credit her with a hit; the clients and her supporters argue that she picked up on something that the medical professionals missed. We witnessed some examples of this when we watched her giving readings to volunteers at the Open Center in New York. She told one volunteer that she saw a problem with his right shoulder. After the reading, this volunteer told Monica that he had not previously realized something was wrong with his shoulder. Neither his previous medical examinations nor anything in his experience suggested something was wrong with his shoulder. I thought, as a result, he might be skeptical about Natasha's claim. Instead, he was impressed. He decided she had detected a problem that neither he nor his doctors had noticed.

Possibilities of Natasha Picking Up Clues by Non-paranormal Means

I have described just some ways that testimonials can appear to support Natasha's claim even if she is picking up no information about her clients. Those possibilities would suffice to make such testimonials useless as evidence for her ability. The testimonials become even more suspect when we realize how the circumstances of her readings allow her to pick up information about her client without having X-ray vision. Natasha is looking directly at her client when she does her diagnosis. This means that we cannot rule out the possibility that she is picking up clues from subtle (and not-so-subtle) client reactions. To make matters worse, the clients begin a session by asking Natasha questions about their concerns. This provides obvious clues about their condition. I watched one reading where the client began asking Natasha about her back. This narrows considerably the number of possibilities that Natasha needs to consider. Natasha can also gain considerable information from verbal exchanges with the client.

Another source of clues is how the clients react, both verbally and nonverbally, to her statements. Some of her clients say that they find it unsettling when Natasha is staring at them. This could enhance the tendency for individuals to react to her statements with subtle, unwitting bodily movements, breathing changes, pupil dilations, and other signs of emotional and cognitive states. Although psychological research has documented how humans frequently provide unconscious clues to their current thoughts and emotions, most people seem unaware of this possibility. The research also shows that subtle clues can influence us without our consciously realizing it.

One classic case involved the German horse Clever Hans.[2] In the early twentieth century, Hans became a celebrity in Germany and throughout the world. People could ask him questions about addition, the identity of musical pieces, about foreign words, spelling, and many other topics. Hans would answer by tapping his hoof or by nudging an alphabet board with his nose. He usually was correct. Prominent educators certified that he had the intelligence and competence of a thirteen- or fourteen-year-old German student. Oskar Pfungst, a German psychologist, investigated Hans with exemplary thoroughness. He eventually discovered that Hans was clever only in having "horse sense." Typically, a questioner would focus on the horse's right hoof, which Hans used to tap out the answer. When questioners focused on the hoof, they would almost imperceptibly lean forward and become tense as they watched the horse tap out the answer. This slight leaning and tensing were Hans's cues to begin tapping. When Hans had tapped the appropriate number of times, the questioner would unconsciously relax and move his or her head upwards very slightly. Often this movement was one millimeter or less. This was Hans's clue to stop tapping.

Pfungst then carried out experiments to confirm this finding. He played the role of Hans. He would invite people to stand beside him and think of a number. Pfungst would then begin tapping with his right hand. He would stop when he thought he detected a very slight bodily movement—usually a very slight displacement of the subject's head. These movements were extremely subtle, rarely more than a millimeter in extent. Pfungst amazed his volunteers, stopping his tapping at the number they had in mind.

Pfungst tried this experiment with twenty-five persons ranging in age from five years to adult. He succeeded in picking up cues from all but two of them. They insisted they were unaware of giving him any information. Pfungst used the same method to divine other kinds of thoughts the subjects had in mind. The subjects again denied that they had provided any clues about what they were thinking. Other psychological experiments have confirmed these results. Some skilled performers have made careers out of pretending to read minds when, in fact, they were relying upon subtle and unwitting clues provided by their volunteers.

Some reports supporting Natasha's claim describe outcomes consistent with the possibility that she is picking up such clues. For example, a Russian reporter says that he became a convert to Natasha's cause when she found the exact spot on his arm where he had fractured his wrist many years before. In another case, a reporter from a British tabloid validated Natasha's ability when Natasha succeeded in identifying the location of the fractures she had received in an accident. Both cases seem ideal for picking up the sorts of clues that Pfungst found that most people provide without realizing they are doing so.

What I have just written does not show that Natasha lacks X-ray vision. We do not know from the evidence offered by her proponents whether she does or does not have a paranormal capacity to see into people's bodies. What we do know is that the accounts that seem to support Natasha's claim are consistent with both normal and paranormal possibilities. We also know that nonparanormal mechanisms can and do operate in the real world. We *do not know* that paranormal ability, such as that claimed for Natasha, exists. So far, no one has displayed such ability with scientific credibility. Given these two possible explanations for Natasha's apparent successes, rationality tells us to bet on the nonparanormal one. We should demand convincing evidence that is scientifically acceptable before we give credence to the paranormal claim.

The Test Protocol

With input from Richard and me, Andrew wrote the test protocol, titled "Test Design and Procedures for Preliminary Study of Natasha Demkina." The goal was to make every aspect of the test explicit. The protocol stated how we would conduct the test and how we would interpret the results. We wanted all parties to be clear about what would and would not be considered a "successful" outcome. What makes a scientific experiment or a test meaningful is just such an explicit commitment to the interpretation of the outcome *before we observe the data.* This is a critical distinction between the post hoc interpretation of testimonial evidence and the prior commitment to specified outcomes of a meaningful test. Natasha's defenders apparently fail to grasp this essential point.

The written protocol protects the interests of all parties. Natasha and her supporters had the opportunity to study the document, to suggest modifications, and finally to agree or disagree with its provisions. The protocol also protects the investigators against a variety of false accusations about how we conducted the test.

We made sure to include in the protocol the statement that the "test is not in any way a definitive test. Deciding the truth of Natasha's claims with comfortable certainty is too simple and brief. It can only help to decide whether further studies of Natasha's claimed abilities are warranted." This statement is worth elaborating. Understanding what the test can and cannot do is essential. Even under ideal circumstances this test could not clearly decide if Natasha does or does not have X-ray vision. Any scientific hypothesis—especially a paranormal one—cannot be confirmed or disconfirmed by one test or one experiment. Scientific investigation requires a series of experiments. Each new experiment builds on the results of previous ones. The more we learn from the early experiments, the better we can understand what we need to control and what we can safely ignore. If the hypothesis is implausible and/or controversial—as Natasha's claim certainly is—then the original investigators must replicate their findings. In addition, independent investigators must also replicate the findings before they gain scientific credibility.

We knew that our test could not distinguish between two possibilities: (1) she can make correct matches using external clues; or (2) she can make correct matches using paranormal X-ray vision. The alternatives we could control or reduce were that she gets correct matches just by luck or that her correct matches are due to those factors that make vague statements seem like hits.

We were also aware that our test could only detect a large effect. Natasha's claim can be considered in several contexts. The testimonials imply that she is highly accurate. This has practical consequences. If clients are depending upon her for medical diagnoses, Natasha's readings should be reliable. Otherwise, she can do much harm. Of course, Natasha could possess paranormal powers, but they could be weak and erratic. Such unreliable and weak ability would be useless for medical diagnosis, but would still be of theoretical interest. We lacked the resources and time to try to detect such a weak effect. We used all our resources to obtain seven subjects. If we had been trying to test for a moderate or weak effect, we would have had to use many more subjects. Given the constraints of our task, this was impossible. Our test, then, was aimed at detecting a large effect. We reasoned that if she possessed the reliability of diagnosis that her proponents claimed, our test would reveal this. Such an effect would encourage us to investigate her abilities in more detail.

The outcome of the test could be from zero to seven correct matches. We set the criterion for success at five correct matches. We clearly stated this criterion in the test protocol and all parties agreed to this in advance. Although Natasha's mother says that her daughter never makes a mistake, we did not want to demand that Natasha perform perfectly. We wanted to give her some margin for error. Keep in mind that if she got five or more correct this would be consistent with her having the X-ray power that she claims. Yet it would also be consistent with the possibility that she was matching the target condition by normal means such as the appearance and behavior of the subjects.

The Test

Richard Wiseman, Andrew Skolnick, and I collaborated in designing the test. We arrived at a mutually satisfactory plan after exchanging several e-mails. The task of finding appropriate subjects, and coordinating the many details was left to Andrew. He had less than one week to accomplish all this. He had to do this from Amherst, more than 350 miles from New York City.

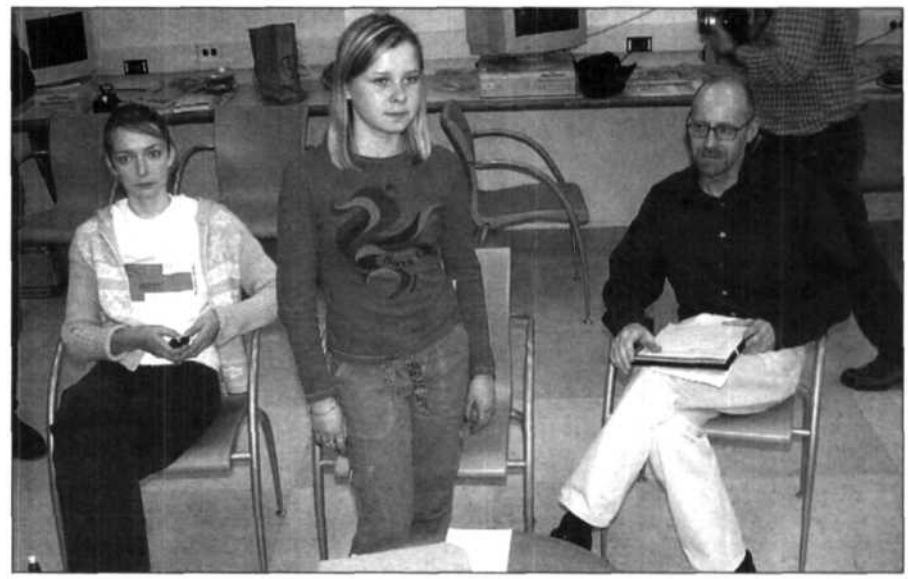
Austin Dacey, executive director of the Center for Inquiry–*MetroNY*, obtained an excellent set of rooms for the test at the City College of New York and helped recruit several subjects. Dr. Barrie Casselith, Chief of Integrative Medicine Service at Memorial Sloan-Kettering Cancer Center, helped us with the daunting task of assembling seven appropriate and willing subjects. On the morning of the day of the test we learned that two of the subjects had withdrawn. Again, Andrew and Austin saved the day by finding two replacements at the last moment. (Andrew's separate article about certain aspects of the tests follows mine.)

During the test, we seated the seven subjects in a semicircle facing the chair where Natasha sat. Each volunteer had an internal condition that should be easy to detect if Natasha's claim is correct. The target conditions were as follows: One patient had metal surgical staples in his chest from open heart surgery; one had a section of her esophagus surgically removed; one had a large section of one lung removed; one had an artificial hip replacement; one had a missing appendix (we discovered afterwards that another subject also had a missing appendix, which he didn't mention when we recruited him. Natasha chose neither of these two as the one with the missing appendix); one had a large brain tumor removed and now has a large hole in his skull covered by a metal plate; and the final subject had none of these target conditions.

During the test, when Natasha was looking at the subjects, the subjects wore sunglasses whose lenses were covered with opaque tape. This prevented the subjects from knowing when Natasha was looking at them. This also prevented Natasha from picking up clues from their eye movements or pupillary dilations (which are a sign of emotional reaction). Before the test, I instructed and rehearsed the subjects on how to behave. They were to sit as still as possible when Natasha was in the room. If Natasha needed to observe them in a standing position, I would tell Natasha to turn her back while they stood up and when they sat again. We used similar precautions if Natasha needed to look at them in profile. These precautions reduced the possibility of reactions by the subjects from knowing which target condition Natasha was currently studying. We also wanted to reduce external movements (for example, the subject with a hip replacement might give herself away from her efforts to stand or to change the position of her body).[3]

The test room was large and had chairs for our seven subjects, for Natasha and two interpreters. One interpreter was Natasha's friend Sveta Skarbo. We allowed her in the test room to make Natasha feel comfortable. The other interpreter was supplied by the Discovery Channel. Ideally, only I, as the head proctor, Richard Wiseman as my co-investigator, Natasha and the two interpreters, and the seven subjects should have been present during the test. The realities of television production and the requests of Natasha's companions forced us to compromise here, and in some matters of protocol. The test room also included a television crew of three persons from the production company (Shine, Ltd.); Austin Dacey, who was videotaping the proceedings for CSICOP; Joe Nickell as an observer; a still photographer from the Discovery Channel; and Will Stewart, a British journalist living in Russia who was acting as a representative for Natasha. Except for the subjects (and Austin Dacey), everyone in the test room, including myself, was blind to the condition of each subject.

A small room, attached to rear of the test room, was used for briefing Natasha. We could retreat to this room when we wanted to discuss matters out of sight and hearing of the subjects. Because Andrew was in charge of recruiting the subjects and was not completely blind to their conditions, he stayed out of the testing room. He remained in the briefing room during the entire test (which lasted more than four hours). We used this room to brief Natasha before each of the six required matches (once she had made six matches, the seventh was determined by default). Before each trial Andrew gave her a clear description, along with images and diagrams, of the target condition that she was to match to a subject. We also discussed any of Natasha's questions or concerns in this room.



Natasha Demkina stands between her friend Svetlana Skarbo (who served as her translator instead of the one hired by Discovery Channel) and Richard Wiseman, who helped to design and conduct the CSICOP-CSMMH test. Photo credit: Andrew A. Skolnick

Andrew and I met with Natasha in this room before the test to review the procedure and to remind her about the details of the protocol. She had agreed to this protocol, which Monica had shown her five days previously. We reviewed each condition that we would ask her to detect. She expressed concerns about the removed appendix and the resected esophagus. She was worried that if the appendix had been removed long enough ago it might have grown back. Andrew assured her that appendices do not grow back. Her concern about the resected esophagus was that individuals might normally differ in the length of their esophagus and this could mislead her. Andrew told her that instead of the length she should look for the scar that completely encircled the place where the two ends of the resected esophagus had been surgically joined.

The test consisted of six trials. On each trial Andrew gave Natasha a test card that clearly described, in Russian and English, the condition she was to match to a subject. The card contained an illustration of the target organ or condition. Andrew also showed her relevant illustrations from an anatomy text. When she was satisfied, I accompanied Natasha to the test room, where she sat between the two interpreters and equidistant from each subject. After Natasha had studied the subjects for the given condition, she chose the subject she believed had the specified condition. She would circle the subject's number on the test card and both of us would sign the card. We then returned to the back room to prepare for the next condition and trial.

We wanted to make the test as comfortable and nonstressful for Natasha as possible. I made sure not to rush or pressure her in any way. I gave her all the time she wanted to make each match. She took one hour to make the first match—which was to find the subject who had a large section of the top of her left lung surgically removed. She required more than four hours to complete the matches of conditions to the seven subjects. Throughout this process I repeatedly asked her if she was comfortable and if we could do anything to make the process more agreeable to her. She could ask for a break in the proceedings whenever she wished. Her mother had decided to remain outside both the test and briefing rooms because she wanted to be with Natasha's younger sister. Midway through the proceedings, Natasha told us she would feel better if her mother could be in the briefing room. I immediately agreed to her request.[4]

The Outcome

Natasha succeeded in correctly matching four target conditions out of a possible seven. Our protocol required that Natasha get five or more correct matches to "pass" our test.

Understandably, Natasha's supporters were disappointed. They expressed their misgivings about the test on the television documentary, in media interviews, on Web sites, and through e-mails. They accused the testers of bias and of deliberately manipulating the procedure to prevent Natasha from succeeding. Natasha has complained that if she had gotten five correct she would have been a success. Isn't four close enough?

Our answer is that five was the minimum score that everyone agreed upon. It was also the minimum score that would convince us of a possible ability to diagnose subjects with sufficient reliability to be useful. We designed our test to detect a large effect. We were looking for something that would distinguish Natasha's claims from many similar ones. We wanted a

good reason to justify using the additional time and resources to investigate her ability further.

Although Natasha's score did not meet our criterion for "success," it is possible that she can pick up information about the subject's condition. Some of her choices might show some accuracy on her part, although of a low level. If this is true, her correct matches could be the result of three possibilities:

1. She gathered some information paranormally. That is, she can see into people's bodies, but imperfectly.
2. She gathered information by deliberately exploiting available clues such as outward appearances and behavior of the subjects.
3. She obtained information unconsciously from available clues. To me, this is the most likely explanation, other than chance or in addition to chance. Much recent work in psychology demonstrates implicit learning: how people unconsciously learn to exploit a variety of clues, often subtle ones.

Both inherent and unforeseen limitations of our test provided possible clues to the target conditions for some subjects. I already discussed the daunting task of finding seven appropriate subjects. We had to settle for a less than optimal set of subjects. These subjects differed sufficiently in outward appearance to provide possible clues about their conditions. Another problem occurred through two violations of the test protocol. Together these problems created the possibility for identifying the target conditions—by external, normal means—for the following four subjects:

1) The "control" subject, the one who had no internal medical condition, was obviously the youngest of the group. He also looked in good physical condition and appeared much healthier. He was a good candidate for the person with no defects.
2) The subject with the staples in his chest (because of major heart surgery) was male, the oldest of the group and looked the least healthy. He was an obvious choice for the person with the staples in his chest.
3) A breach of protocol occurred on the first trial. Natasha posed a question and her interpreter translated it aloud in front of the subjects. The question, contrary to our protocol, allowed the subjects to know that Natasha was looking for the subject with part of her lung removed. Here it was possible that, knowing which condition Natasha was looking for, the subject with the missing lung might have given *herself away through bodily reaction.*
4) After the test was over, I learned that Natasha and her companions, because of an apparent misunderstanding, had arrived at the test site before we had expected them. They *waited outside the test building where they reportedly* observed at least two of the test subjects climb the long flight of stairs and enter the test building. This breach of protocol may have provided them clues about which subjects *did or did not have the artificial hip.*

We do not know if Natasha took advantage of the clues I've described in the previous four paragraphs. However, it is suggestive that these were just the four subjects for whom Natasha achieved her correct matches. The probability that she was relying upon nonparanomal clues increases when we consider her *misses. She wrongly picked the subject who was wearing a base*ball cap as the one who had the metal plate in his head. Conceivably, she picked this subject because one might assume *(falsely in this case) that the subject was trying to cover a scar* on his head. We should also emphasize that her failure to correctly match the subject with the metal plate in his head further argues against any fledgling paranormal powers. If she truly can see into bodies, she should have easily detected the large area of missing skull along with the metal plate covering the hole.

Our test included five subjects for whom external clues were available concerning their internal condition. The clues correctly pointed to the true target condition for four subjects. The external clue for the fifth subject falsely pointed to the *hole in the skull. In each of these five cases Natasha made her* choice consistent with how the external clue was pointing.

Because a single test, even one done under ideal conditions, cannot settle a paranormal claim, we conceived our test as the first stage of a potential series. The first stage would not necessarily rule out nonparanormal alternatives. If Natasha could pass the first stage, this would justify continuing onto the next stage. If she passed that stage, then we would continue studying her claim. On the other hand, if she failed at any of the *early stages, this would end our interest in her claim.*

Keep in mind that the burden of proof belongs to the parties making an extraordinary claim. Extraordinary claims require extraordinary proof. Our test had its limitations. None of these limitations, however, worked against Natasha's claim. If anything, they may have artificially enhanced her score. Our task was not to prove that Natasha does not have X-ray vision. Rather, Natasha and her supporters had the responsibility to show us that she could perform well enough to deserve further scientific investigation. This they failed to do.

Acknowledgments

I thank Richard Wiseman (University of Hertfordshire) and Andrew Skolnick (Commission for Scientific Medicine and Mental Health) for their many constructive criticisms to the earlier drafts of this paper. Richard convinced me to eliminate over half the material I had intended to include. This was a great improvement.

Notes

1. We debated about how to refer to the seven volunteers who had conditions which Natasha had to detect. Each of the candidate terms such as *volunteer, participant, patient,* or *client* seemed ambiguous or not quite correct. Although not completely satisfactory, we decided to refer to these individuals as *subjects.*

2. Pfungst, O. 1911. *Clever Hans.* New York: Henry Holt & Co. Also see Vogt, E.Z., and Hyman, R. 2000. *Water Witching U.S.A.* Chicago: University of Chicago Press.

3. Here is another compromise we had to make in the test. Ideally, everyone in the test situation should be blind as to the true target condition for each subject. In our case, the subjects were not blind to their own conditions. Because the subjects had to be in the test room and Natasha had to study them visually, the test lacked this blindness. The use of the opaque sunglasses hopefully kept the subjects blind as to which target condition Natasha was looking for on a given trial, but this is not completely satisfactory.

4. At the start of the test some initial confusion existed as to who would be allowed into the test and briefing rooms. This was quickly corrected and Natasha's mother and Will Stewart were given the option of staying in one of these rooms. □

Natasha Demkina

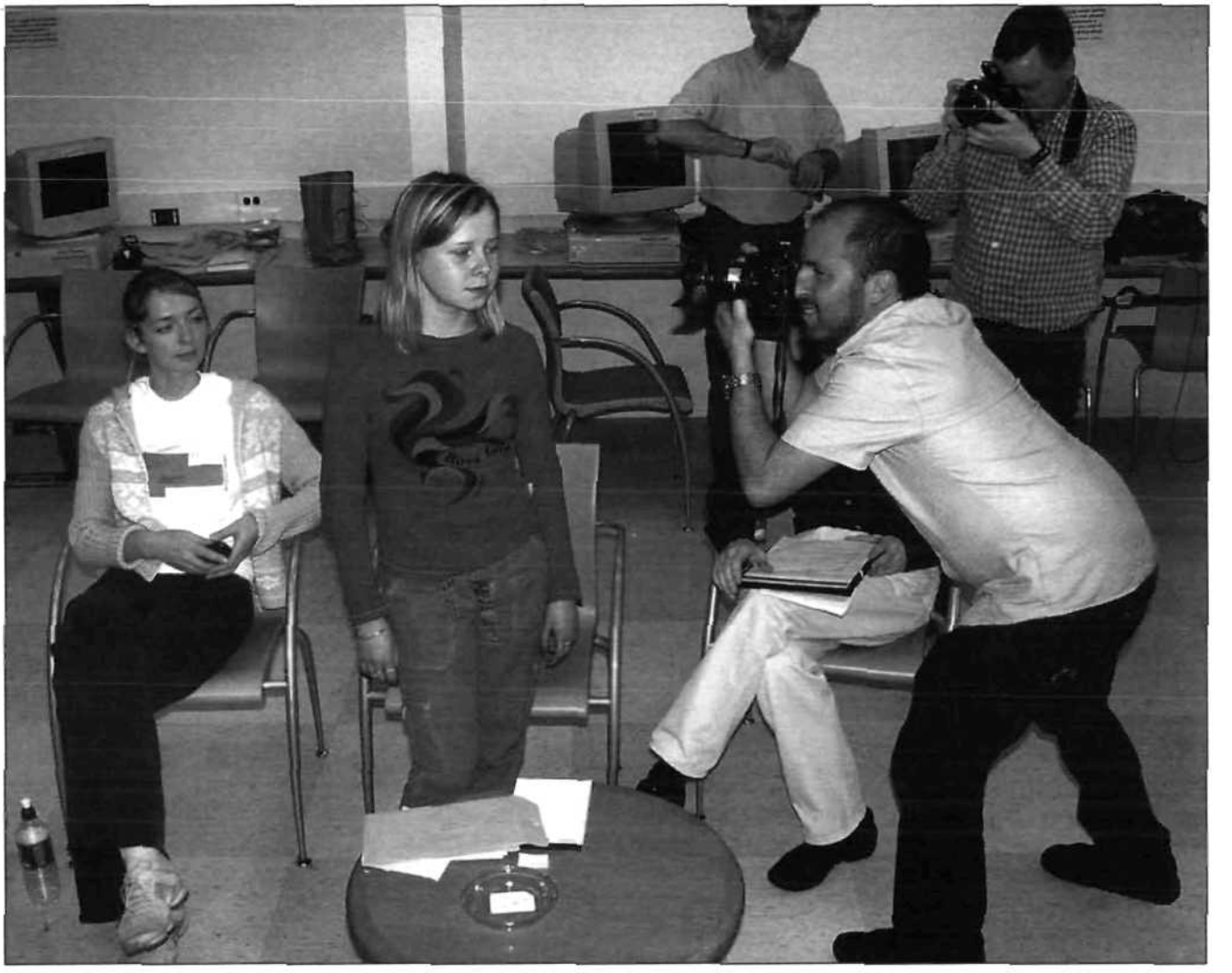
The Girl with Normal Eyes

Many people in Russia and the United Kingdom believe a teenage girl can identify diseases in patients better than their physicians. Investigators who tested the medical psychic for a Discovery Channel program don't agree.

ANDREW A. SKOLNICK

One hundred ten years ago, German physicist Wilhelm Roentgen announced the discovery of an invisible form of radiation that could make photographs of bones and organs inside a living human body. At first, many scientists called the discovery of mysterious "X-rays" a hoax, but when the skeptics put Roentgen's claims to the test, they were quickly convinced about one of the greatest discoveries in science and medicine. Indeed, just six years after his discovery, Roentgen was awarded the first Nobel Prize in physics.

Now comes a teenage girl from Saransk, Russia, who claims to have X-ray-like vision that lets her see inside human bodies. And she uses this vision to make medical



After the CSICOP-CSMMH test of Natasha Demkina, a Discovery Channel photographer takes publicity shots for *The Girl with X-ray Eyes*. The program, already broadcast several times in Europe and Asia, has never been shown in North America. The author believes the program may be considered too skeptical for a more credulous American audience. Photo credit: Andrew A. Skolnick

diagnoses that, she claims, are often more accurate than those of doctors. Widely hailed in Russia as "the girl with X-ray eyes," seventeen-year-old Natasha Demkina has a growing number of patients, doctors, journalists, and others who are convinced her powers are real.[1,2] That following is proving lucrative for Natasha *and her family. The young psychic reportedly charged about* $13 per reading and provided about ten readings each weekday night. That income, about $2,600 a month, is more than forty times the average monthly income of government workers in Saransk.

In March 2004, Monica Garnsey, the producer-director of a Discovery Channel documentary on Natasha, asked the Committee for the Scientific Investigation of Claims of the Paranormal (CSICOP) to scientifically test the young woman's claims for the program. Because Natasha's paranormal claims involved medical diagnoses, I was asked to join CSICOP fellows Ray Hyman and Richard Wiseman in designing an appropriate preliminary test, to see if the medical psychic's abilities warranted further study. (Hyman's accompanying article, "Testing Natasha," is the report of those tests.)

Examining the claims of medical psychics like Natasha Demkina presents unique difficulties beyond the usual problems involved in testing dowsers, mind readers, and most other paranormal claimants. For example, we needed to consider the logistical, legal, and ethical concerns regarding the privacy of subjects' medical information. Barrie Cassileth, chief of Integrative Medicine Service and the Laurance S. Rockefeller Chair in Integrative Medicine at Memorial Sloan-Kettering Cancer Center, was willing to help us recruit volunteer subjects through the Center. However, the Center declined involvement in the

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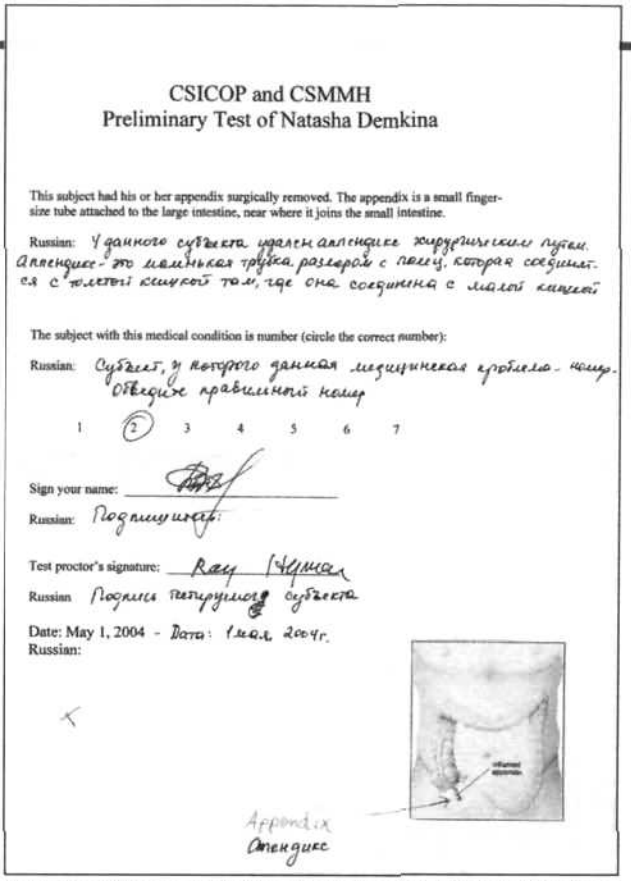
documentary, so Cassileth could only assist us unofficially by recruiting four of the seven volunteers we needed from her personal acquaintances.

We wanted a test that would prevent Natasha from making diagnoses that could not be disproved, as is her usual practice. So we settled on a simple test design that required Natasha to find already established medical abnormalities in the test subjects. This not only eliminated the problem of her giving us a long list of health problems that cannot be disproved, it eliminated the problem of subjects trying to force Natasha's vague comments to fit their existing problems. And it prevented the potential harm that could result from subjects being frightened into undergoing unnecessary and invasive medical tests to rule out diseases that Natasha claims to see.



CSICOP and CSMMH
Preliminary Test of Natasha Demkina

This subject had his or her appendix surgically removed. The appendix is a small finger-size tube attached to the large intestine, near where it joins the small intestine.

Russian: У данного субъекта удален аппендикс хирургическим путем. Аппендикс - это маленькая трубка размером с палец, которая соединяется с толстой кишкой там, где она соединена с малой кишкой

The subject with this medical condition is number (circle the correct number):

Russian: Субъект, у которого данная медицинская проблема - номер. Обведите правильный номер

1 (2) 3 4 5 6 7

Sign your name:

Russian: Подпишитесь:

Test proctor's signature: Ray Hyman

Russian Подпись тестирующего субъекта

Date: May 1, 2004 - Дата: 1 мая 2004г.
Russian:

Appendix
Аппендикс

This is one of the six test cards that were used to assess Natasha's ability to see abnormalities within the subjects' bodies. In English and in Russian, the card directed Natasha to identify the number of the subject who doesn't have an appendix. Natasha answered subject number 2—a woman who still has her appendix. Natasha protested during the test that appendixes can grow back after an appendectomy. When told this isn't possible, she insisted that they do grow back in Russia. Photo credit: Andrew A. Skolnick

Such a calamity happened to Dr. Christopher Steele, the host of a medical television show in the United Kingdom, who in 2004 invited Natasha on his show to provide "medical readings." When she read Steele, she said she saw something wrong with his gall bladder and that he had kidney stones and an enlarged liver and pancreas. The physician rushed off to have a battery of expensive and invasive clinical tests—which found nothing wrong with him.[3] In addition to being exposed to unnecessary diagnostic radiation, he had a colonoscopy, which is not without risks. Studies have found that .2 percent (two tenths of one percent) or more of patients who undergo colonoscopic screening suffer a bowel perforation, which can lead to life-threatening infection and the need for surgery.[4,5]

We wanted to conduct a blinded test. Natasha claims to see through people's clothing, yet she says she cannot see through a fabric screen, which we wanted to use to prevent her from seeing the test subjects. We found this unexplained contradiction curious—and frustrating: Any test she would agree to would have to allow her to study the test subjects using her normal senses. As Hyman points out, this study flaw alone could provide an astute person powerful clues about a person's health problems. It would be less of a problem if we were able to recruit subjects who were physically and demographically similar. Unfortunately, we had great difficulty recruiting subjects for the test and had to settle for several people with characteristics that suggested their target conditions.

Natasha claims she can see everything inside of people's bodies down to the cellular level, and her mother says her readings are 100 percent accurate. So the test—which required her to match at least five of the target medical conditions to the correct subjects—should have been very easy compared with her normal readings. She didn't have to scan entire bodies looking for unknown conditions. She was told exactly what to look for and exactly where to look. Yet it took her more than four hours to complete the test and, inexplicably, she took an hour to examine the seven subjects before deciding which one was missing a large part of her left lung! She guessed that one correctly, but why would anyone who claims to be able to see "every cell" inside a person take an hour to decide which person was missing a large portion of one lung?

Natasha matched only four of the conditions correctly—a score that everyone prior to the test had agreed would not justify further testing. Natasha's most dramatic misdiagnosis was her failure to see a large metal plate covering a missing section of skull in a man who had a large brain tumor removed. Instead, she indicated that she "saw" a metal plate and missing skull section in a man who had his appendix removed but a normal skull.

There was an error in our test protocol, which could have been much more embarrassing for us, had Natasha had the power to see it. Although our test design[6] required no more than one subject to have any of the target medical conditions, we discovered after the test was over that the man who had a metal plate in his head also had undergone an appendectomy. He had forgotten to mention this when he was recruited but brought it up after the test because a missing appendix had been one of the test target conditions. This mistake gave Natasha twice the chance of correctly guessing which subject was missing his or her appendix. Despite having twice the odds of being correct, she still chose a subject with an intact appendix.

After the test, Natasha asked if she could give me a medical reading in the hope of convincing me that her powers are real. With CSICOP's Senior Research Fellow Joe Nickell taking notes, I agreed. Her reading, in which she scanned me from head to toes while describing the abnormalities she saw, took

about ten minutes. Few of my organs passed the inspection: My neck vertebrae were too tight, too close. The bronchial tubes of my lungs had phlegm causing me to cough. The muscle on the left side of my heart is a bit weak and the valve closes late. The mucosa of my stomach is abnormal. A segment of my liver was enlarged and I was suffering poor bile circulation. The head of my pancreas is increased and abnormally dark (although not seriously). My duodenum has a little scar. My prostate gland has a nodule and is inflamed. My right kidney has "sand," while my left kidney's urethra is enlarged. In other words, I should forget about ever again signing an organ donor card.

Natasha Demkina supporters widely cite this "diagnostic" drawing of a "sarcoidosis granuloma" as evidence of her remarkable "X-ray" vision. Yale Rosen, M.D., a leading expert on sarcoidosis granuloma, however, disagrees. Frame from the Discovery Channel program *The Girl with X-ray Eyes*. ©2004 Discovery Channel

Neither my physician nor I are aware of *any* of these problems. Nevertheless, Natasha and her supporters claim she sees what doctors and their tests often miss. The only way I could prove her wrong would be to submit to an autopsy—which I'm not quite ready to do.

I believe Natasha may have been making some bad guesses based on non-paranormal observations. While the test was ongoing, I swallowed some water down my wind pipe, which triggered a loud fit of coughing. It was so loud that someone had to close the briefing room door. Natasha apparently misjudged the cause of my coughing. My shoulders and neck were sore and tired from lugging around my luggage and a heavy camera bag. She apparently misread my drooping posture as a sign of a spinal problem. And earlier, I had complained to the Russian translator that I had a headache (from stress and lack of sleep). I suspect that information may have been passed on to Natasha, who wrongly attributed the problem to narrowed blood vessels in my neck. Even more telling was what Natasha didn't "see." She failed to point out any of my confirmed health problems, which include hypertension, hypercholesterolemia, recent colon surgery, nasal polyps, a very narrow pharynx, and sleep apnea. She also didn't see the calcified plaque in two of my coronary arteries that was documented by spiral CT scan.

The Discovery Channel program, *The Girl with X-ray Eyes,* has already been broadcast several times over the past six months in Europe and Asia,[7] but has not been broadcast in North America. The program highlights one of Natasha's most impressive diagnoses, involving a man who says he had been treated for tuberculosis for a year yet hadn't gotten any better. In desperation, he turned to Natasha for help. Unable to describe what she saw in the man's lungs, she drew a picture. With the help of Natasha's drawing, the man got a referral to a doctor in Moscow, who claimed to see the same thing through her microscope and that the drawing is indicative of an inflammatory disease lesion called sarcoidosis granuloma. That's a remarkable confirmation of the young psychic's powers—at least for viewers who don't have a clue what sarcoidosis granulomas look like.

It didn't look like any pathological finding I've seen, so I sent an image of the drawing to Yale Rosen, M.D., Professor of Pathology at SUNY Downstate Medical Center, a leading expert on sarcoidosis granuloma, whose *Atlas of Granulomatous Diseases* is widely used in the training of pathologists.[8] Here is Dr. Rosen's opinion of Demkina's drawing:

> Try as I might I can see no resemblance whatsoever of this drawing to a granuloma or to any other microscopic pathologic finding that I know of. If I were presented with this drawing and no background history I would guess that it was made by a 4–6 year old child who was trying to depict a human-like head with four appendages (? arms and legs) attached. If Ms. Demkina is claiming that a physician made a diagnosis of sarcoidosis based upon this drawing I would say that that's simply unbelievable.

We've asked the producer/director several times when the documentary may be broadcast in the United States. We have not received an answer. I am afraid that Discovery Channel may consider the program too skeptical for the American audience. I hope I will be proven wrong.

Notes

1. Moniche, Igor. 2004. X-ray girl sees right through *Sun* man. *The Sun.* Available at www.satori-5.co.uk/word_articles/misc/xray_eyes.html.

2. Hagan, Lucy. 2004. Girl "sees" broken bones. *The Sun.* Available at http://groups.msn.com/Mindtalk/itspossible.msnw.

3. TV doctor in health scare after meeting "X-ray vision" girl. 2004. *Ananova.* Available at www.ananova.com/news/story/sm_860742.html?menu=news.scienceanddiscovery.

4. Kavic, S.M. and M.D. Brasson. 2001. Complications of endoscopy. *American Journal of Surgery.* April; 181(4):319–32.

5. Anderson, M.L. et al. 2000. Endoscopic perforation of the colon: lessons from a 10-year study. *American Journal of Gastroenterology* December; 95(12):3418–22.

6. Test Design and Procedures for Preliminary Study of Natasha Demkina. 2004. CSICOP and CSMMH. Available at www.demkina/demkina.protocols.doc.

7. *The Girl with X-ray Eyes.* 2004. The Human Files series, Discovery Channel. Program description available at www.discoverychannel.co.uk/humanfiles/feature2.shtml.

8. Rosen, Yale. *Atlas of Granulomatous Diseases.* Available at www.granuloma.homestead.com. □

Psychic Swindlers

An investigative television reporter looking into a shady psychic uncovers a dangerous underworld of fraud and scams.

AMY DAVIS

As an investigative television reporter in San Antonio, I am bombarded on a daily basis by questions, faxes, e-mails, and phone calls. Everyone has a problem, and they all want me to help solve it. Shoddy contractors, sketchy sales pitches, get-rich quick schemes. Eventually, they all run together in a maelstrom of malfeasance. But a call to our news desk in February 2004 piqued my interest, with its claims of curses and clans, psychics and scams.

A phone call from a panicked mom and dad first turned me on to the Evans clan. Terry Trotter wanted help when she called our station. Her twenty-one-year-old daughter, Shante Smith, had just confessed she'd taken out cash-advance loans and department-store credit to the tune of

$25,000 and turned it all over to a psychic by the name of "Miss Brooks."

By the time Shante told her parents and the police what had happened, she was drowning in debt and ducking bill collectors at every turn. "I didn't know what else to do; and I couldn't tell anybody, or Miss Brooks would say, 'If you tell anybody, I could die.'"

Naturally skeptical of anyone who would willingly give a perfect stranger thousands of dollars, I was hesitant to take on the assignment. Even if the psychic had used half-truths and intimidation to get the money, the headline forming in my mind didn't strike me as newsworthy or a revelation by anyone's standards. "Psychic Swindles Sucker" could share the same page as "Pickpocket Takes Wallet."

I pushed those thoughts to the back of my mind for later consideration and agreed to interview Smith. My first question was the most obvious. What in the world would convince her to give a psychic so much money?

A naive college sophomore, Smith struck me as the type of student who spends more time studying what clothes she'll wear to class than the subjects she signs up to study. Like many girls her age, she was impressionable, boy-crazy, and wanted to be liked. Smith told me she and some girlfriends had recently talked about going to see a palm reader for fun; so when she found a flyer for "The Psychic Spiritualist" tucked under her windshield wiper at a shopping-mall parking lot, she thought it must have been a sign. The superstitious student called the number on the card that day and knocked on Miss Brooks's door the next.

"I thought I was gonna pay $35. She was gonna tell me a little bit of information; and then I was gonna be on my merry little way," Smith recounted. But that's not how it happened. In

Jennifer Evans's husband Tommy Evans hides behind groceries when confronted by the author about theft allegations.

that first visit, Smith figuratively showed her cards before Evans had a chance to literally read them. Smith spilled her guts, revealing she was smitten with a boy on campus. The girl wanted Miss Brooks to tell her if she had a future with her crush. The answer wasn't simple. Yes, Shante would win the heart of her beau. But Miss Brooks ominously disclosed that the man would die of cancer if Shante didn't do something soon.

Smith said the brazen crystal-ball reader convinced her she was cursed; and only Miss Brooks (whose real name we later learned was Jennifer Evans) could break the spell. "Anybody I truly loved dearly would die from a horrible disease," Smith said. "I got all nervous and worried, just like anybody would if somebody told you someone who you love was gonna be dying of cancer."

Once the psychic succeeded in scaring Shante, she quickly offered a solution. She ordered Shante to immediately withdraw all of the money from her bank account and bring it back. Within minutes, Smith returned with $400. Evans told her she would be in touch.

Less than 24 hours later, Smith woke up to her ringing cell phone. Evans told her to get up; the two had lots of work to do if they wanted to reverse the fate of Shante's true love. Evans's first instructions were easy enough. "You need to get all of your credit cards and get your limits raised as high as you can." Not satisfied with the few cards Shante already had in her wallet, Evans sent her to the mall to fill out applications. In just one day, Saks, Sears, and Zales all extended credit to the college coed. Smith said Evans called her cell phone constantly. "She's like, 'When you get to each store, call me when you get there, and let me know what they approved you for.'" Under the psychic's direction, Smith purchased gift cards in the full amount of her credit line, and handed them over.

The plan, as relayed by Evans to Smith, was to lavishly dress two life-size Brazilian statues. The sculptures supposedly symbolized Smith and her soon-to-be lover. Adorning the effigies with the best clothing and accessories would mean Smith could expect the same luxuries in her own life. Even three months later, flat broke and no closer to the boy she gave so much for, Smith still thought Evans might come through for her. Smith's mother believes her daughter was easily duped because the smooth-talking psychic preyed on her religious convictions, lighting votive candles and speaking of angels that could help her case. "When you talk about churches and God and blessings, that creates trust. You want to believe in someone because you know that He is real."

Getting the Story

Armed with one side of a possible story, I had to decide how best to get the other side. Simply confronting Evans with Smith's accusations would give the psychic an opportunity to say anything, leaving me with no real way to evaluate her responses. I needed a firsthand account of Evans's psychic talent and tactics. We needed to get her spiel on camera, but first we needed a volunteer victim. In television news, these adventurous assignments are usually doled out to producers. They're smart, they understand the legalities of using hidden cameras, and because they're not on-air, they aren't recognized as station employees. Our Special Projects producer offered to take a camera hidden in a purse. We gave her $40 and a blank tape for what we thought would be the first of several visits with the accused. Even my

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news director doubted the psychic would pounce on our producer's first appointment. We all suspected Evans would want to feel out her new prey and gain her victim's trust before she tried to get any money. We were wrong. What our producer captured on tape in just one session was all we needed to convince us Evans wasn't just selling fortunes, she was stealing them.

Evans's shop, a storefront paned with dark-tinted glass and with a huge sign reading "The Psychic Spiritualist," doubled as her home. When she unlocked the door to greet our producer for their 10 A.M. appointment, she was still wearing her pajamas. Small and slender, without a touch of makeup, the brunette could have easily passed for a teenager. But her speech exuded confidence, and her tone was reassuring and authoritative.

"What I would like you to do, sweetie, is cut the cards one time and make one wish when you cut the cards."

The producer truthfully confided, "I wish that my husband and I will buy a house here in San Antonio."

Then Evans cut to the chase. "It'll be $35 up front for the reading," then promptly added—after she had the producer's two twenties in her hand—"I don't have change. Is that okay?"

Assuming it would have to be, our producer nodded her head in agreement; both women were working to gain each other's trust. The next line of conversation confirmed Evans not only deceives her customers about their own futures, she concocts tall tales of her own travels and adventures.

"I'm not even from here," offered the psychic. "I'm from Canada. I lived in Brazil for fifteen years, New York for ten, Chicago, California when I became the celebrity psychic. And for the last five years, I've been here."

By her account, the psychic would be at least thirty, but Evans's driver's license reveals she is only twenty-three. A lie like that is easy to disprove with documents, but Detective Ray Patterson of the Bexar County Sheriff's Department says it doesn't always work that way. "The other stuff is so intangible," he explains. "If I say I'm going to cure cancer for you, and you don't get cancer,

Undercover video of Jennifer Evans telling a news producer that three curses have been placed on her.

how can you prove otherwise?" Patterson said Shante's experience was familiar: "They targeted somebody who was weak-willed and extorted money from her. I just think it was a girl that came in that was at a low point in her life, and was looking for some type of direction; and Jennifer Evans took advantage of it."

Evans used the cancer-curse fortune on many customers, and our producer was no exception. Evans said an old enemy paid someone to cast a spell on my coworker. "Sweetie, what's on you is so serious. She put for you not to lose your soul mate to another woman, but for you to lose him to some type of sickness or colon cancer."

The producer was shocked. "Colon cancer?"

"Yeah," nodded Evans, her lips curled in a knowing purse. "She doesn't want you to be happy. She does not want you to be content. She wants to see you sad. She wants to see you weep. 'Cause she could never be happy . . . so she wants to make you miserable. You always had everything she wanted. Morals, true love, that charisma . . . you know. She's wicked. She's jealous. You should know that."

About halfway through the session, Evans revealed the producer's nemesis also put a curse on her that would cause her to never have as much money as she would like. This conveniently spurred a line of questioning that would make even a used-car salesman blush. Evans looked up from a tarot card and said, "It's also telling me you've been trying to save up for something. But if you really want to be honest, tell me. You got to talk to me. What do you want?"

"To go on a trip to Ireland," admitted the producer.

Evans pressed her. "How much do you need?"

"I don't know . . . a couple of thousand or two."

Moving on, but tying it all together as if she needed to know, Evans continued. "Okay . . . do you owe any money on any credit cards or anything like that?"

"Some . . . but we're paying them off," replied the producer.

"How much do you owe?"

"Several thousand."

"Okay . . . what else do you owe on? What's a major debt you want to get rid of?" All of a sudden jumping back into her heroine roll, Evans said, "Tell me what's a major debt you want to get rid of 'cause I'll help you get rid of it."

"Cars—car debt—and credit cards," the producer rattled off her financial portrait. "We have about three credit cards. They're not really high or whatever. But we'd like to pay them off."

"Okay . . . how much would you say you owe on each one?"

"Um . . . around two thousand . . . twenty-five hundred for each."

"What was your limits on each one?"

"Um, our limit on the card . . . I think a lot higher than that."

Unabashed, the psychic then wanted to know about the producer's checking and savings accounts, even how much she expected to get back in taxes. She finally concluded her interrogation by making a promise. "Whatever's in checking, whatever's in savings, is gonna quadruple for you in five days after I do this. I'm gonna walk you through everything so you understand. What's the amount in checking and what's the amount in savings?"

"Umm . . . I have about five thousand dollars, and it's only in one account."

Evans urged our producer to rush to the bank immediately, withdraw all of her money, and return with it as quickly as possible. The producer did leave, but she never went back to Evan's

shop. At this point, she was more than ready to end her involvement in our investigation. Evans had taken her cell number; and when the producer didn't return within ten minutes, the soothsayer started dialing nonstop. Her voice-mail messages went from sweet to pleading to threatening. After the last beep, Evans said she had already opened the case; if the producer didn't come back to finish what she'd started, she could die. The producer is still very much alive. While she admits she doesn't want to ever face Evans again, she says it's the woman's menacing vibe and very real propensity for criminal behavior that frighten her more than any voodoo hocus-pocus. As I did more research, I found a nefarious streak running throughout her family's lineage. Members of the Evans clan don't only pose as palm readers, they are involved in a long list of shady activities. When Detective Patterson began investigating Jennifer Evans and her family, he found hundreds of social security numbers and names linked to just a handful of the family members. "There appears to be a lot of names floating around. It seems like their practice is . . . they'll assume alias names, they'll change a few numbers in their Social Security number and pull a scam. And then after that's all done, they'll move on to a different name, different Social and continue on."

The Evans Family

In a modest Van Nuys, California, neighborhood, far from San Antonio, an elderly man slowly hobbled to his front door, balancing his frail figure on a sturdy wooden cane. The knock annoyed the nearly ninety-year-old man, until he looked outside. A Hispanic-looking woman in her late forties told him she worked as a home-health nurse, and had been sent by Medicare to look after him and his bedridden wife. For two weeks, this unexpected miracle of a maid washed and cooked. Then she cleaned out the couple's life savings.

Federal investigators never figured out how this nefarious nurse found the elderly couple or how she convinced AARP and Vanguard to cut checks for the entire amount in their retirement accounts. The mysterious woman vanished as quickly as she appeared, but detectives did trace the checks to a bank in San Antonio, where they'd been deposited by a man named Nicky Evans. Nicky is Jennifer's uncle by marriage; and even though many stories like the Van Nuys scheme are connected to his name, his record is clean. When police began questioning Nicky Evans, a pillowcase stuffed with $179,000—the exact amount taken from the California couple's accounts—turned up on the doorstep of the district attorney's office. No charges were filed.

The cross-country-con case was just one of many relayed to me by local investigators when I began asking around about the infamous yet mysterious Evans family of San Antonio. Other common trades in the family are driveway paving, roofing, and remodeling, which cops say are sometimes fronts, providing the Evans family a way inside to case people's homes. Jennifer Evans's husband has been busted for insurance fraud at least twice. Many times when victims try to file complaints against members of the Evans clan with police they're told they are dealing with a civil, not criminal, matter. An FBI

Nicky Evans, Jennifer's uncle, walks out of his own San Antonio psychic shop.

agent confided to me that the San Antonio office simply doesn't have the resources required to devote to sorting through the multiple aliases, business fronts, and fraud. At the local level, manpower is usually shifted to more tangible crimes like property theft and murders.

But most veteran officers know the self-proclaimed clan of Gypsies by name, and they all have their own personal accounts of bizarre encounters with them. Some people swear that the clan has state and local officers on their payroll. While I haven't been able to confirm this rumor, I don't doubt it. It would certainly explain why there are so many crimes reported but so few prosecuted. I spoke to investigators who helped me absorb as much information as possible before my face-to-face with any of the family members, knowing they would undoubtedly use any ignorance of mine to their advantage.

Confronting the Con Artist

When I pulled up to Evans's storefront, her husband was just getting out of his Lincoln Navigator with groceries in hand. As I introduced myself, our photographer recording the entire exchange, Mr. Evans shielded his face with his bags. Jennifer opened the door to let him in.

"I'm coming to ask you about a girl who says you took $25,000 from her," I blurted out before she could close the door.

She denied the accusation. "It's all lies. I'm a psychic. People can say whatever they want about me," shouted Miss Evans. "Right," her husband jumped in. "They can say I bought a Rolls Royce, too. Do you see a Rolls Royce over here?"

After hurling several insults and threats laced with profanity, the pair slammed the door. I tried repeatedly to talk to them without success. But my efforts didn't stop there. There are seven psychic shops in San Antonio owned by Evans family members, but none were willing to talk to us about their psychic abilities or address the complaints of fraud against them.

One irate anonymous caller claimed she was a member of the clan, adding, "Why are you going after us Gypsies? Is it because we drive brand-new cars and you don't? Because you have to work for yours?"

Jennifer's mother-in-law operates another psychic business. When I called her, she told me she'd been meaning to get in

touch with me. She said she needed to warn me that she saw some "pretty scary things" in her cards. "Miss Davis, you should know, if you don't stop messing around with these psychics, you're going to get hurt."

The threats certainly didn't stop me from proceeding with the story, but the Evans's intimidation campaign did keep others from coming forward. One man who'd been shot by Jennifer's father-in-law in the early 1980s could certainly testify to the family's tendency toward violence. When I tried to track him down, I discovered he moved away from San Antonio shortly after the shooting. I left several voice-mail messages for the man but got no response until one day when I checked my e-mail. This is the message I found in my in-box:

> If your (*sic*) the one asking about (the man shot by Steve Evans) just stop. he got screwed in the deal and they tried to kill him more than once and he just wants to be left alone. if you dig it up again your name will be added to there *(sic)* hit list. the guy deserves some peace. your bio sounds nice, looking for justice and all but you must leave this one alone. thx. a friend

The Police Step In

Two weeks after our story aired, deputies arrested Jennifer Evans as she turned on the glowing neon "open" sign in the front window of her home. Since that time, over a dozen other victims have come forward. A school teacher who refinanced her home lost $50,000; another woman gave Evans up to $15,000 and even bought her a kitchen stove.

Jennifer Evans covers her face while being arrested for theft by deception.

To Assistant U.S. Attorney Fred Schattman, the most interesting part of it all is that the victims self-select. Most often, those who lose the most have the least to give. Widowers, the terminally ill, people who've hit rock bottom and exhausted all the traditional sources of help. "They were remorseless con artists," Schattman says of the seven Evans family members he prosecuted in the Dallas-Fort Worth area four years ago. "The people we convicted crossed the line, and they did it repeatedly." Seven members of the Evans family were convicted of mail fraud and aiding and abetting for using the mail as a part of the psychic scams. The victims included lawyers, accountants, and doctors, many of whom did not want to cooperate with the investigation out of embarrassment.

Schattmann says in some of the cases, victims were reassured that their money would benefit a church or religious organization, although no such affiliation was ever proved. Jennifer Evans used the same tactic in San Antonio with Shante Smith, convincing the young woman that she owed a debt to a church that was helping with "her case." Evans told Smith to order a big-screen television from a major electronics store and have it delivered to a church in Plano. But upon further investigation, we discovered there is a home at the address Evans gave to Smith. At the time the store delivered the TV, Evans's own mother was renting the house.

"It fit a pattern of theft. It looked like she'd been either coerced or threatened into doing something," said Detective Patterson. That one delivery allowed prosecutors to charge Evans with theft by deception.

"Hopefully, her life has been turned upside down, just like she turned my life upside down within three months," said Smith after learning deputies had arrested Evans.

Police arrested Jennifer Evans outside a San Antonio post office on January 24, 2005. While preparing for her upcoming trial, prosecutors with the Bexar County District Attorney's office asked U.S. Postal Inspectors to screen the psychic's mail. To date, they've identified five more victims who have mailed Evans nearly $80,000. Inspector Ed Moreno said Evans was placing ads in West Coast yellow pages advertising psychic phone lines. For an initial $150, she tells callers she will begin praying for their cause. Other promises and miracles would cost a greater amount, usually thousands of dollars. Evans was picking up a $25,000 check mailed to her post office box the day she was arrested. Officers say she gave them a fake name and date of birth. Nine of her alleged victims are claiming a total of $230,000 was stolen from them. Prosecutors have now backed away from their offers of a plea deal and say they have filed Evans's case as a first degree felony. Evans is currently on house arrest awaiting an April 11 trial date.

"If the case just goes away, we lose the ability to track her," says Patterson, now at the mercy of prosecutors. The seasoned investigator confessed that his sergeant never would have assigned him the case if it weren't for pressure from our broadcast. Response from our story gave the district attorney's office a list of about a dozen victims. As people called me with similar stories of how they'd been swindled, I passed them on to prosecutors. Most had not called police to report the theft; those who had hadn't gotten far. Complaints against soothsayers get lost among reports of property theft, robbery, and other routine crimes.

Some officers actually refuse to take such reports or at least strongly discourage victims from reporting the offenses. Another college student ripped off by Evans told me she will never forget what cops told her. "They laughed at me. They were just like, 'Oh, you're just going to have to chalk it up to experience because you're not getting your money back. There's nothing we can do,'" she recalls.

But since Detective Patterson invested so much time and energy in the case, he wants to see Evans prosecuted. A conviction might send a message to psychics and soothsayers who prey on the hopeful and vulnerable. □

Getting the Monkey off Darwin's Back

Four Common Myths About Evolution

Evolution is poorly characterized by certain commonly used phrases. Properly communicating how evolution works requires careful attention to language and metaphor.

CHARLES SULLIVAN and CAMERON McPHERSON SMITH

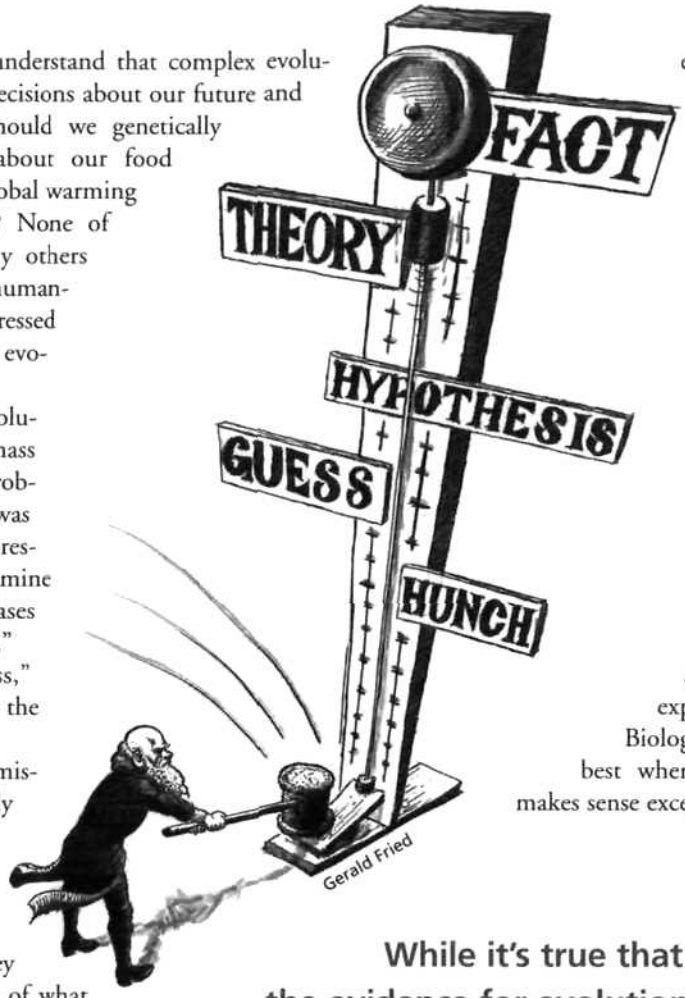
Nearly 150 years after Charles Darwin published *On The Origin of Species*, the theory of evolution is still widely misunderstood by the general public. Evolution isn't a fringe theory, and it's not difficult to understand, yet recent surveys reveal that roughly half of Americans believe that humans were created in their present form 10,000 years ago (Brooks 2001, CBS 2004). The same number reject the concept that humans developed from earlier species of animals (National Science Board 2000).

But the evidence is clear that no species, including humans, simply "popped up." Each life form has an evolutionary history, and those histories are intricately

intertwined. If we don't understand that complex evolution, we will make poor decisions about our future and that of other species. Should we genetically modify humans? How about our food crops? What effects will global warming have on human biology? None of these questions, nor many others of immediate concern to humanity, can be usefully addressed unless we understand the evolutionary process.

In examining how evolution is portrayed in the mass media, we found many problems; chief among them was the use of inaccurate expressions. In this article we examine the commonly-used phrases "evolution is only a theory," "the ladder of progress," "missing links," and "only the strong survive."

These expressions are misleading at best, and simply wrong at worst. Most of these phrases have ancient roots, describing biology as it was understood centuries ago. They lead to a distorted picture of what evolution is and how it works.



Evolution Is Only a Theory

Have you ever heard people challenge evolution by claiming that "it's only a theory?" The Cobb County School District in Georgia did just that when it sought to put stickers on high school biology textbooks stating that, "Evolution is a theory, not a fact, regarding the origins of living things."[1] The problem with this claim rests with two different uses of the word *theory*. In popular usage the word refers to an unsubstantiated guess or assumption, as when someone theorizes that a light moving across the night sky must be an alien spaceship. When scientists use the word *theory*, however, they're referring to a logical, tested, well-supported explanation for a great variety of facts.[2] In this sense the theory of evolution is as well supported as the theory of gravitation or other explanatory models in fields such as chemistry or physics. While it's true that much of the evidence for evolution is not obtained by laboratory experiments, as in chemistry and physics, the same can also be said for geology and cosmology.

A geologist cannot travel back in time to observe first hand the formation of Earth's crust, and a cosmologist cannot witness the collapsing of a star into a black hole, but this doesn't mean that scientific theories about the nature of these phenomena are simply unsubstantiated guesses. Some scientific theories do a better job of accounting for the facts than others, and in biology there is no competing scientific theory with more explanatory power than evolution. Biologist Theodosius Dobzhansky put it best when he said, "Nothing in biology makes sense except in the light of evolution."

While it's true that much of the evidence for evolution is not obtained by laboratory experiments, as in chemistry and physics, the same can also be said for geology and cosmology.

Many people confuse evolutionary theory with Lamarckism, named for the French naturalist Jean-Baptiste Lamarck (1744–1829). In one sense Lamarck was an evolutionist in that he favored the view that new species had evolved from ancestral species, but he was mistaken about the mechanism by which species change, and about the time required for these changes. Lamarck thought that the mechanism for biological change was the transmission to the next generation of characteristics *acquired during the life span of an individual.* His most famous example is that of the giraffe. According to Lamarck, the giraffe's ancestors had shorter necks, and they would stretch their necks to reach higher foliage in trees. Their descendants then inherited longer necks because the characteristics of these newly stretched necks of the parents were passed down to their offspring. Moreover, Lamarck thought that the evolution of a new species could occur within a few generations or even one. His position was reasonable for its time, yet it happens to be incorrect.

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But acquired characteristics are not passed on.[3] If you lose your arm in an accident, your offspring will not be born with a missing arm. If you lift weights to gain muscle mass, you will not transmit larger muscles to your offspring. Jews have been practicing circumcision for hundreds of generations, yet there is no evidence that this acquired feature is biologically inherited.

The position of modern evolutionary theory (Neo-Darwinism[4]) is that some ancestors of giraffes acquired slightly longer necks through random mutation. These animals could eat food that was a little out of reach of others of their species, and so they tended to be healthier, to live longer, and have a better chance than their fellows at mating and passing on to the next generation their genes for longer necks. Many such incremental changes over a long period of time are required for a new species—or a neck as long as a giraffe's—to arise.

The evolution of giraffes or other life forms should not be thought of as a singular process. There are at least three independent processes that, when taken together, form our idea of evolution. These are replication, variation, and selection. Replication is essentially reproduction. Variation refers to the random changes—typically mutations—arising in offspring, making them different from their parents. Selection refers to the process whereby those individuals best adapted to their environment tend to be the ones that survive, passing on their genes. These three processes occur every day in nature, and it is their cumulative effect that we call evolution.

The Ladder of Progress

The word *evolution* is sometimes used to mean progress. People speak of moral evolution when discussing certain cultural changes that have been for the better, such as the increased recognition of the rights of women. Or they speak of technological evolution when comparing present-day technology with that of ancient hunter-gatherers. This sense of the word *evolution* implies a progressive development toward better or more advanced stages. It is this non-biological sense of *evolution* that influences people to think of biological evolution as involving ladder-like progress from lower to higher stages.

The idea of an evolutionary ladder of progress has its roots in Classical Greek and Medieval European concepts about the nature of the universe. The most common manifestation is known as the Great Chain of Being, which was most influential in Europe from the fifteenth through the eighteenth centuries. The basic idea of the Great Chain of Being is that God and his creation form a hierarchy which is ordered from the least perfect things or beings at the bottom of the chain to the most perfect at the top, namely, God himself. Simply put, the ranking from bottom to top is as follows: rocks or minerals, plants, animals, man, angels, God.

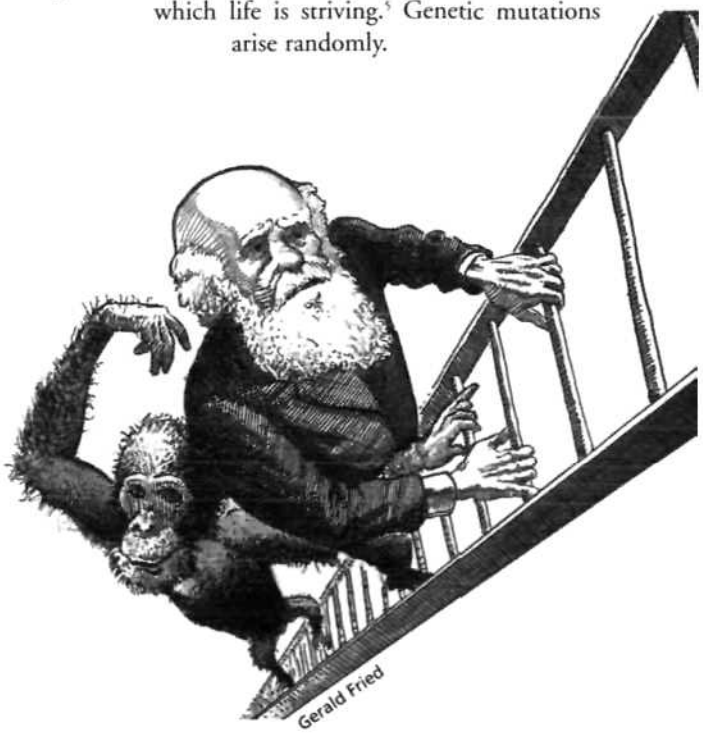
The Great Chain of Being scheme wasn't designed with evolution in mind since the prevailing idea of the time was that God made all existing species, in their modern forms, long ago. The Great Chain of Being is best described as a method of classification. This idea began to lose support before the Darwinian revolution, but Darwin's ideas and their refinement ultimately broke the links of the Great Chain of Being.

The modern biological understanding of evolution does not involve progress in the sense of a natural upward goal toward which life is striving.[5] Genetic mutations arise randomly.

Evolution is indeed a theory, but it's a theory with a lot of evidence on its side, and with more explanatory power than any competing theory in biology.

If an entirely new scientific theory with more explanatory power is formulated, then Neo-Darwinism will have to be swept aside just as Lamarckism was. Creationism and Intelligent Design don't qualify as competing scientific theories because they're not scientific. They don't offer natural explanations for biological phenomena, but rather supernatural explanations which cannot be tested scientifically. Neo-Darwinism offers a natural explanation to account for the facts of evolution, and rejects supernatural explanations.

When discussing the theory of evolution it's important to realize why it's misleading to say that evolution is *only* a theory. Evolution is indeed a theory, but it's a theory with a lot of evidence on its side, and with more explanatory power than any competing theory in biology.



A study of the DNA of Darwin's finches on the Galapagos Islands (Petren et al. 1999) provides a good example of why the idea of progress makes no sense in evolution. The study's findings suggest that the first finches to arrive on the islands were the Warbler finches (*Certhidea olivacea*), whose pointy beaks made them good insect eaters. A number of other finches evolved later from the Warbler finches. One of these is the *Geospiza* ground finch, whose broad beak is good for crushing seeds, and another is the *Camarhynchus* tree finch with its blunt beak which is well adapted for tearing vegetation.

Even though the seed-eating and vegetation-eating finches evolved from insect-eating finches, the former are not "more evolved" than the latter, or "higher" on some evolutionary ladder. Since finch evolution on the Galapagos Islands was driven primarily by diet, the ground finches simply became better adapted at making a living on seeds, the tree finches on vegetation, and the Warbler finches on insects. If seeds were to become scarce on the Galapagos Islands, it's conceivable that the seed-eating finches—which are a more recent species—could become extinct, while the insect-eating finches—which have been around much longer—would continue to thrive. The concepts of "higher" and "lower" do not apply to the Galapagos finches or anywhere else in evolution. It is fitness or adaptability relative to the environment that matters. Species cannot foretell the future in order to adapt themselves deliberately to environmental changes, and if the environment changes drastically, those adaptations that were once favorable may turn out to be unfavorable.

Even though biologists reject the Great Chain of Being or any similar ladder-of-progress explanation of evolution, the idea still persists in popular culture. A more accurate analogy would be that of a bush that branches in many directions. If we think of evolution over time in this way, we're less likely to be confused by notions of progress because the branches of a bush can grow in various directions in three dimensions, and new branches can sprout off of older branches without implying that those farther from the trunk are better or more advanced than those closer to the trunk. A more recent branch that has split off from an earlier branch—like a species that has evolved from an ancestral species—does not indicate greater progress or advancement. Rather, it is simply a new and different growth on the bush, or more specifically, a new species that is sufficiently adapted to its environment to survive.

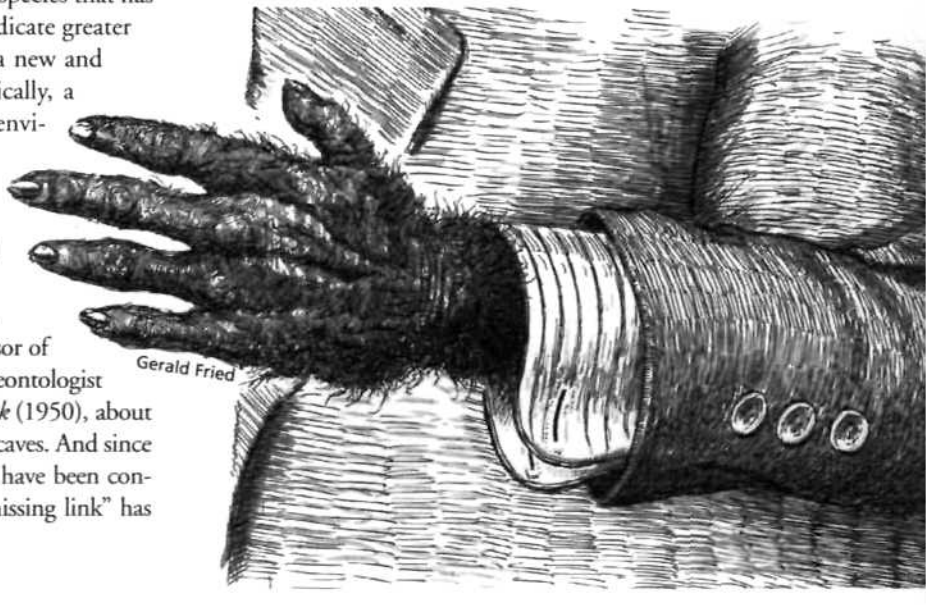
The Missing Link

"Fossils May be Humans' Missing Link" reported the *Washington Post* on April 22, 1999. The story states that fossils discovered in Ethiopia ". . . may well be the long-sought immediate predecessor of human beings." But almost fifty years earlier, paleontologist Robert Broom published *Finding the Missing Link* (1950), about his discovery of fossil "ape men" in South African caves. And since 1950, reports of the discovery of "missing links" have been continuous. What's going on? How is it that the "missing link" has been discovered repeatedly?

The problem lies in a false metaphor. When we say "missing link," we invoke a metaphorical chain, a set of links that stretch far back in time. Each link represents a single species, a single variety of life. Because each link is connected to two other links, each is intimately connected to past and future forms. Break one link, and the pieces of the chain can be separated, and relationships lost. But find a lost link, and you can rebuild the chain, reconnect separated lengths. One potent reason for the attractiveness of this metaphor is that it allows for the drama of the quest, the search for that elusive missing link.

But the metaphor is as misleading as it is attractive. The concept that each species is a link in a great chain of life forms was largely developed in the typological age of biology, when species "fixity" (the idea that species were unchanging) was the dominant paradigm. Both John Ray (1627–1705) and Carolus Linnaeus (1707–1797), the architects of biological classification (neither of whom believed in evolution), were concerned with describing the order of living species, an order they each believed was laid out by God (Ray suggested that the divinely specified function of biting insects was to plague the wicked). But while the links of a chain are discrete, unchanging, and easily defined, groups of life forms are not.[6] We generally define a *species* as some interbreeding group that cannot, or does not, productively breed with another group. But since species are not fixed (they change through time), it can be difficult to be sure where one species ends and another begins. For these reasons, many modern biologists prefer a continuum metaphor, in which shades of one life form grade into another.[7] Life is not arranged as links, but as shades. The metaphorical chain is far less substantial than it sounds.

Thus the chain metaphor is wrong. It doesn't accurately represent biology as we know it today, but as it was understood over four centuries ago. The myth persists because of convenience; it is easier to think of species as types, with discrete qualities, than as grades between one species and another. In school, we learn the specific characteristics of plants and animals; this alone is not a problem, except that we are not often



exposed to the main ramification of evolution: *that those characteristics will change through time.*

Clearly, both the *Post* article and Broom's book describe the discovery of australopithecenes, African hominids[8] that lived well over three million years ago. Australopithecenes walked upright, like modern humans, but they had large, chimp-like teeth, and smallish, chimp-like brains. Australopithecenes made rudimentary stone tools that are more complex than any chimpanzee's termite-mound probe stick, but far less complex than the symmetrical tools made by early members of our genus, *Homo.* In terms of anatomy and behavior, some australopithecenes really do appear to be "half human." Additionally, it's widely believed that early *Homo* descended from some variety of late australopithecene. Broom was right after all, but so was the *Post*; a "missing link" has indeed been found. It is *Australopithecus.* But there were many varieties of *Australopithecus*, as well as *Homo*, and there is no obvious place to draw a discrete line separating a shade of late *Australopithecus* from an early grade of *Homo.* Therefore, it's more accurate to say that we have found some "grade" or "shade," rather than "the missing link."[9]

We can curb the false metaphor by changing our wording. In classes, in textbooks, in discussions with our students, and in press releases (the critical connection between academia and the general public), we have to start saying that we're looking for *a* missing link, rather than *the* missing link. Better yet, we should replace the "missing link" stock phrase with something more accurate.

Only the Strong Survive

Around a million years ago, an ape so large that it's now known as *Gigantopithecus* roamed the bamboo forests of South Asia. Standing nine feet tall, weighing from 600 to 1,000 pounds, and with a bamboo-crushing jaw the size of a mailbox, this was a truly strong creature. But today, all that remains of *Gigantopithecus* are a few fossil teeth and jawbones, quietly resting in museum vaults.

If only the strong survive, how did early *Homo*—protohuman bipeds that were in the same area at the same time, and were less than half the size of *Gigantopithecus*—survive? Wouldn't any clash between these creatures result in the strapping über-ape annihilating the competition?

Yesterday's giants can be today's museum specimens. If only the strong survive, though, how is this possible? Indeed, how is it that humans are now ascendant on Earth, but, when stripped of tools and culture, we are among the most helpless of animals?

The answer, of course, is that strength can be measured in many ways. Brawn is one measure; brain is another. But this distinction is often lost in popular culture. When we say "the strong," or even "the fittest," most people immediately think of competition between individuals. These individuals, we imagine, are pitted against one another in some evolutionary arena, where they fight for survival and mates. The strongest survive, pass on their genes, and propagate their lineage. The loser, and its entire lineage, goes extinct.

But this notion of single combat in a single arena of competition is too simple. In reality, there are dozens of arenas, dozens of problems any organism must face in life. Perhaps direct competition with other individuals is one, but every day individuals are kicked from one arena to the next. If the river dries up, you're now in the Arena of Water Conservation. If the temperature suddenly drops, you're pushed into the Arena of Heat Conservation. If the properties of the vegetation you eat begin to change, you're now in the Arena of Metabolic Versatility.

In short, survival is much more complex than is implied by the single-arena concept of combat between individuals. Life forms struggle against a wide array of factors, and often against more than one factor at a time. In biology, these factors are known as *selective pressures.*

Selective pressures also change. A certain selective pressure can be particularly hard-pressing for a period, shaping the course of evolution, but later that pressure may ease, and another concern becomes primary. And since the environment is always changing, no species can ever be sure what selective pressures it will have to cope with tomorrow. Indeed, such conscious anticipation of the future is precluded for most species (could deer have anticipated the invention of guns?), and evolution is entirely reactive, shaping species according to past and present environments, but never "looking" into the future.[10]

We humans, and all life forms, exist and struggle not in any single arena, but in an immense web of selective pressures that is incomprehensibly complex and ever-changing. Survival is much more involved than simply beating down your immediate peers.

Why does the single-combatant, evolutionary arena myth persist? The answer is probably deeply intertwined with renaissance values of individualism too complex to examine here[11] but it is clearly related to nineteenth-century Social Darwinism. Social Darwinists grafted Darwin's basic ideas about biological evolution to human society and economy. To them, progress could only be made by eliminating imperfections from humanity, and this was best done by competition. That competition, neatly summarized by Herbert Spencer's term "survival of the fittest," was taken to mean the competition between individuals. It is significant that today's reality-TV programs are steeped in this metaphor, in which the concept of survival via ruthless individual competition is paramount.

The best way to curb this myth is to teach that brute strength does not guarantee long-term success. In fact, no single characteristic does. More importantly, we need to describe *why* there is no single key to long-term success, because we never know how our selective environment is going to change. For humanity, then, the only hope for success, for survival, is in remaining flexible and adaptive. Real strength is in adaptability, which comes from genetic and cognitive variation.

Conclusion

A picture of evolution based on the common myths we've outlined is a mosaic of confusion. It's very important to remedy this confusion, because how we think of ourselves, and every other species on Earth, is directly related to how we understand evolution. We can either see ourselves as separated from a natural world that simply serves as a theater for our evolution,[12] or as one of many coevolving species of life on Earth. The former view is more likely to persist if we continue to describe evolution using obsolete or faulty expressions. The latter view, which is accurate, will be promoted by a better use of language, and by acknowledging what we have learned about biology in the past 150 years.[13]

Solutions for conveying this accurate view must include more careful use of language and metaphor to explain exactly what evolution is, and how it happens.

Notes

1. The entire disclaimer reads: "This textbook contains material on evolution. Evolution is a theory, not a fact, regarding the origin of living things. This material should be approached with an open mind, studied carefully, and critically considered." This led to a lawsuit, *Selman v. Cobb County School District.* On January 13, 2005, a federal judge found this policy unconstitutional.

2. See, for example, "What's Wrong with 'Theory not Fact' Resolutions." *National Center for Science Education.* 7 December 2000. Available at www.ncseweb.org/resources/articles/8643_whats_wrong_with_theory_not__12_7_2000.asp.

3. However, a recent study on fruitflies suggests that some genetic instructions that are not encoded in the DNA may be passed on to offspring by way of material encompassing the DNA (Lin et al. 2004).

4. Developed in the 1930s, Neo-Darwinism (also called the Modern Synthesis) integrates Darwin's theory of natural selection with the theory of genetic inheritance first proposed by Gregor Mendel and subsequently refined by later biologists.

5. Biologists disagree about whether there is an evolutionary tendency toward complexity, primarily because there is no consensus on how complexity should be defined and measured.

6. The species concept is introduced in Strickberger (1985:747–756), but also see Mallet (1995) for the need to review how we define species.

7. Lions and tigers once coexisted naturally in India, and although they are outwardly very different, they can mate to create tigons or ligers. Since such hybrids were never found in nature, however, it is known that lion and tiger did not interbreed naturally. Thus, genetically, lion and tiger can be classified as one species, but behaviorally, they differed enough to be considered separate species by biologists, and in nature this difference was maintained by the animals themselves (Wilson 1977:7).

8. Hominids are large primates that walk upright. Those of the genus *Australopithecus* (which predate the human lineage *Homo*) are referred to as australopithecenes. They appear over 4 million years ago. Many hominid varieties have existed, but *Homo sapiens sapiens* is the only living hominid.

9. The link metaphor also suggests that any given species is represented by only one chain, as when we see a diagram of hominids, first knuckle-walking, then hunched over in a half-stand, then upright as modern man. This depiction does not show several other bipedal hominid varieties to which we are related, such as the robust australopithecenes (appearing over 4 million years ago, disappearing about 1 million years ago) or the Neanderthals (who appear around 300,000 years ago and are extinct by c.30,000 years ago). The depiction suggests that there was one, unbroken chain, from quadruped to biped, but actually there have been bipeds that have gone extinct (as well as quadrupeds that exist today).

10. Humanity, of course, is uniquely proactive. We can imagine the future, and we prepare for it by controlling our evolution with all sorts of social and biological methods. Social methods include complex kinship and marriage rules that ensure gene flow among different populations. Biological methods include mass vaccination programs against polio and smallpox.

11. See for example Shanahan (2004), an interesting comment in Commager (1965:82–83), and Butterfield (1965:222–246).

12. We suggest that this view of humanity contributes to wasteful use of resources; for example, humanity has chronically overfished nearly every fishery ever discovered; see Jackson et al. (2001).

13. It's not sufficient to constantly explain away old, inaccurate expressions: we must develop new ones. What is the use in keeping old metaphors or phrases that do not point to reality? For example, we may say "The Bush of Evolution" or "The Labyrinth of Evolution,' rather than 'The Ladder of Evolution." A good way to find such new metaphors may be to create a Web site where anyone could suggest them, and, after a time, select new ones to start incorporating into our common speech. Perhaps poets, being familiar with the power of image and metaphor, could be helpful.

References

Brooks, D.J. 2001. Substantial numbers of Americans continue to doubt evolution as explanation for origins of humans. The Gallup Organization. Available online at www.gallup.com/poll/content/login.aspx?ci=1942.

Broom, R. 1950. *Finding the Missing Link.* London: Watts & Co.

Butterfield, H. 1965. *The Origins of Modern Science.* New York: MacMillan.

CBS News Polls. 2004. Creationism trumps evolution. CBSNEWS.com. Available online at www.cbsnews.com/stories/2004/11/22/opinion/polls/main657083.shtml.

Commager, H.S. 1965. *The Nature and Study of History.* Columbus, Ohio: Charles E. Merrill Books.

Dobzhansky, Theodosius. 1973. Nothing in biology makes sense except in the light of evolution. *The American Biology Teacher* 35:125–129.

Jackson, J., M. Kirby, W. Berger, K. Bjorndal, L. Botsford, et al. 2001. Historical overfishing and the recent collapse of coastal ecosystems. *Science* 297:629–637.

Lin, Q., Q. Chen, L. Lin, and J. Zhou. 2004. The Promoter Targeting Sequence mediates epigenetically heritable transcription memory. *Genes & Development* 18: 2639–2651.

Mallet, J. 1995. A species definition for the modern synthesis. *Trends in Ecology and Evolution* 10:294–299.

National Science Board. 2000. *Science and Engineering Indicators.* Washington, D.C. US Government Printing Office. Available online at www.nsf.gov/sbe/srs/seind/pdf/c8/c08.pdf.

Petren, K., B.R. Grant, and P.R. Grant. 1999. A phylogeny of Darwin's finches based on microsatellite DNA length variation. *Proceedings of the Royal Society of London* B266: 321–329.

Shanahan, T. 2004. *The Evolution of Darwinism: Selection, Adaptation and Progress in Evolutionary Biology.* New York: Cambridge University Press.

Strickberger, M.W. 1985. *Genetics.* New York: Macmillan.

Suplee, C. 1999. Fossil find may be that of humans' immediate predecessor. *The Washington Post,* April 23. pp. A3, A11.

Wilson, E.O. 1977. *Sociobiology.* Harvard, Massachusetts: The Belknap Press of Harvard University Press. □

The Psychologist, the Philosopher, and the Librarian

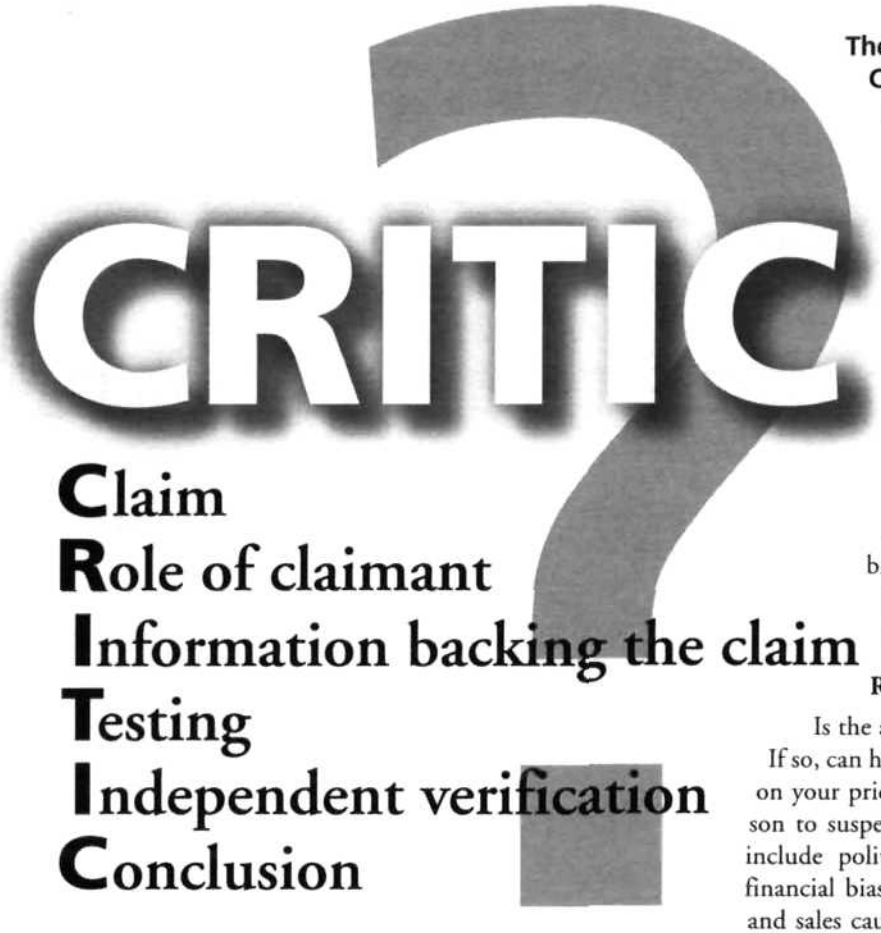
The Information-literacy Version of CRITIC

The information-literacy version of CRITIC expands upon Wayne R. Bartz's development of that acronym. This step-by-step method for introductory critical thinking is reinforced by an exercise inspired by Bertrand Russell.

BRAD MATTHIES

In my role as an academic librarian, I am frequently asked by faculty members to teach information-literacy skills to their students. Broadly defined, an information-literate person knows when information is needed and also has the ability to "locate, evaluate, and use effectively the needed information" (Association of College and Research Libraries 1989). The notion of creating lifelong learners who have the ability to think critically about all manner of information is central to the philosophy of information literacy (Association of College and Research Libraries 2000). An information-literate person has acquired a skill set which allows him to continue learning throughout his lifetime.

During the fall of 2002, my colleague and I designed a



series of library-instruction sessions for a newly developed freshman course. Among the many requirements for this particular course was an emphasis on helping students to think critically about information. In effect, we needed to provide the students with a basic set of information-literacy skills. Aside from being a librarian, I also consider myself to be a "rational skeptic" (Shermer 1989, 17), and on more than once occasion, I have been known to practice philosophy and science without a license. It was while developing the evaluation component of our sessions that I happened to read an article by Wayne R. Bartz, published in the SKEPTICAL INQUIRER (September/October 2002). Calling his methodology an acronym, CRITIC, Bartz described a simple mnemonic method that he successfully used to teach beginning psychology students the scientific method.

My colleague and I adapted Bartz's work and created what I like to call the information-literacy version of CRITIC. Our acronym[1] is a step-by-step process that helps students to evaluate and select credible sources based on the available facts. Like Bartz, we have incorporated elements of the scientific method into our acronym; however, being librarians, we also relied on our expertise in source evaluation, source selection, and information literacy. What follows is our adaptation of Bartz's original idea.

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The Information-literacy Version of CRITIC

Claim?
Role of the claimant?
Information backing the claim?
Testing?
Independent verification?
Conclusion?
(Note: Our last three words vary slightly from Bartz's original acronym.)

Claim

What is your source saying? Is the source's claim both *timely* and *relevant* to your particular question or thesis? Has the source presented the claim in a clear and reasonable manner, or is there evidence of motivationally biased language? If the source is overtly biased or totally unintelligible, you should reconsider using it to support your paper or thesis.

Role of the Claimant

Is the author of the information clearly identifiable? If so, can his or her credibility be established? Also, based on your prior examination of the claim, is there any reason to suspect bias on the part of the author? This may include political, religious, philosophical, cultural, and financial biases. For example, could a concern for profits and sales cause the C.E.O. of an automotive company to state that her company makes the most reliable cars in the world? If you suspect bias or a lack of credibility, this does not automatically invalidate the information. Rather, it means that you will have to place more emphasis on the other steps of CRITIC before you can make a decision on this source.

Information Backing the Claim

What information does the source present to back the claim? Is it information that can be verified, or does this source rely on testimony or anecdotal evidence? If this source presents original research, does the source explain how the author gathered the data? If the source is an article, does it cite references and are they credible? If the source is a journal article, is the journal peer-reviewed? Finally, you should always remember the skeptic's rule: extraordinary claims require extraordinary evidence.

Consider these examples:

> Example 1: The reason that Brand X's car is more reliable than similar cars in its class is that Brand X uses a computer-automated assembly line.
> Example 2: The reason that Brand X's car is more reliable than similar cars in its class is that Brand X utilizes secret, alien technology that only that company is privy to.

Example 1 presents a *reasonable* claim that could be backed up with *ordinary* evidence. On the other hand, example 2 presents an *incredible* claim that would require some *extraordinary* evidence to prove.

Testing

How might you test the claim your source is making? Conduct your own qualitative or quantitative research (e.g., marketing research, statistical analysis, design a research study, etc.).

Example:

Claim: All business majors are Republicans.

Possible test: A survey measuring the political preferences of all business majors may support or disprove this claim.

It may not always be possible or practical for you to conduct a detailed analysis of the information or to carry out actual testing. If this happens to be the case, can you devise a possible way to test the claim? If a claim cannot be tested, then that claim should not be taken seriously.

Independent Verification

Has another reputable information source evaluated the claims the source is making? Does this source support or refute the original claim? After conducting a review of the literature, what do the experts have to say about the claim? Are the experts basing their opinions on detailed analysis and testing, or are they just presenting opinions with little or no evidence? Moreover, are the experts truly experts on the topic, or are they presenting opinions about a topic they are not qualified to discuss? This step may also include speaking to professors, librarians, or someone in the relevant business or industry. If you find that numerous experts confirm the original claim your source is making, then it is *probably* true. If numerous experts dispute the original claim, then the original claim is *probably* false. If you find that the experts do not agree, then the claim that your source is making is, at best, inconclusive. Sometimes, the experts will conclude that there is not enough information to reach a consensus either way. In this instance, you should suspend your judgment until you can find more information.[2]

Conclusion

What is your conclusion about the source? Taking into account the first five steps of CRITIC which apply to your source, make a judgment: Should this source be used in a paper or report? Information evaluation can be very subjective, so it is important to consider all of the ascertainable facts. Remember that the first five steps of CRITIC need to be looked at as a whole before you can make a final decision about your source. Also, not all information sources can be examined using each of the five steps. In this case, you should then consider the steps that do apply to your particular source. Finally, you should always be prepared for undiscovered information that may later invalidate your source.

CRITIC in the Classroom

We developed our version of CRITIC, but still needed an exercise to foster student learning and impress upon students the importance of why they should critically evaluate all information. Being a bibliophile and a skeptic, I decided to consult the skeptical literature for an idea. I found myself rereading Bertrand Russell's *Sceptical Essays*, which soon led me to a solution. Russell writes: "If there is to be toleration in the world, one of the things taught in schools must be the habit of weighing evidence, and the practice of not giving full assent to propositions which there is no reason to believe true" (Russell 1928, 169–170). Following this observation, Russell goes on to describe one such exercise that would do exactly that. He proposes that to teach the value of skepticism, students should be encouraged to study a controversial issue that is well-covered in the media. Naturally, some of this media coverage is biased. Thus, he reasoned, by exposing them to the bias early on, students could be taught to infer what really happened. According to Russell, teaching this type of skepticism "would make the children in later life immune from those appeals to idealism by which decent people are induced to further the schemes of scoundrels."

So, with Russell's eloquently simple idea as my inspiration, we designed a similar activity that we could use to reinforce CRITIC. In our exercise, students are divided into groups and given a preselected source. Using the information-literacy version of CRITIC, each group is required to evaluate its source for credibility. The overall goal is to report to the class on whether the group's source should be used to support the topic of a fictitious paper. Naturally, the key to making this activity work is for the instructor or librarian to select a topic that is widely covered and controversial. For example, one fictitious topic we often use is a paper that investigates Wal-Mart's "Made in the U.S.A." campaign, which was used in the late 1980s. Despite Wal-Mart's claims to the contrary, many of Wal-Mart's products were—and continue to be—made overseas. Moreover, there is what could be best described as a subculture of anti-Wal-Mart activists who generate a prolific amount of anti-Wal-Mart literature. Some of this literature is true, some is biased, some is apparently false, and all of it is suited for this exercise—especially when it is compared to similar, credible sources.

Yet the question remains: does our exercise[3] foster critical thinking? My colleague and I purposely designed this activity around active learning techniques, and we incorporated elements of constructivist learning pedagogy.[4] These strategies allow the instructor to observe learning as it happens; so, while our observations are admittedly anecdotal and potentially biased, we have concluded thus far that CRITIC does indeed work.[5] In fact, from a pragmatic point of view, even if the students do not remember all of the component steps of CRITIC, they do walk away from our workshop with the realization that information can be easily manipulated. This, of course, is the main thrust of Russell's simple idea and likely why the exercise is so effective.

Many of the instructors we work with often create additional class assignments that require their students to use CRITIC (e.g., using CRITIC to evaluate sources in a final project, questions about CRITIC on a quiz, etc.). After presenting the acronym and exercise at a recent library instruction conference, we received many positive comments from our peers, including frequent references to the exercise itself. So far members of the academy seem to be enamored with Russell's

idea. Of course, it is likely that Russell would not be surprised.

In fact, were Russell alive today, I suspect that he would sardonically shake his head at the wealth of misinformation, confusion, and outright quackery that abounds in the information age. Such examples as the Sokal Hoax, which challenge the infallibility of scholarly publications (Sokal 2000), the forged burial box of James, brother of Jesus, the *New York Times* plagiarism case (Adler 2003), and the Raelian fiasco (Mirsky 2003) would only serve to bolster Russell's skeptical mission of outreach and education.

Skeptics should seek out an often-overlooked partner in academia: the librarian. By the very nature of their profession, librarians are constantly organizing, evaluating, and selecting all formats of information to support the cause of education and information literacy.

In conclusion, I issue a two-part challenge to all educators in the skeptical community. First, I challenge all skeptics to teach basic skepticism whenever and wherever they can and to whomever will listen. Moreover, do not be afraid to teach outside of academia and do not be dissuaded by colleagues who might criticize your efforts. Despite being admonished by his peers (Leiber 2004, 12–13), Russell still took the time to make philosophy and critical thinking[6] presentable to the layperson. So, let Bertrand Russell serve as your inspiration!

Part two of my challenge is for all skeptics in education to seek out an often-overlooked skeptical partner in academia: the librarian. By the very nature of their profession, librarians are constantly organizing, evaluating, and selecting all formats of information to support the educational enterprise. Moreover, being staunch proponents of democracy and the freedom to read, they are likely to not shy away from many of the controversial issues that skeptics often become embroiled in (American Library Association 2000), and they certainly are willing to collaborate with anyone who is willing to further the cause of information literacy (Association of College and Research Libraries 2001).

Whether labeled skepticism, critical thinking, or information literacy, these methods need to be widely taught. Indeed, were skepticism taught on a wider scale, perhaps Russell's dream could come true and, collectively, we would finally "revolutionise human life" (Russell 1928, 13).

Acknowledgments

I would like to thank my colleague and fellow collaborator, Jonathan Helmke, Access Services Librarian at Butler University. Were it not for his willingness to try something new, the information-literacy version of CRITIC might not have been a success.

Notes

1. Schick and Vaughn developed a similar acronym called the SEARCH formula. See Theodore Schick, Jr., and Lewis Vaughn, *How to Think About Weird Things: Critical Thinking for a New Age* (New York: McGraw-Hill, 2002), 252–257.

2. Our guidelines for considering expert testimony were adapted from Bertrand Russell's famous maxim on expert testimony. See Bertrand Russell, *Sceptical Essays* (New York: W.W. Norton & Company, Inc., 1928), 12–13.

3. For a detailed explanation of the acronym CRITIC and the CRITIC exercise, please see Brad Matthies and Jonathan Helmke, "Using the CRITIC Acronym to Teach Information Evaluation," in *Library Instruction: Restating the Need, Refocusing the Response: Selected Papers Presented at the Thirty-second National LOEX Library Instruction Conference held in Ypsilanti, Michigan May 6 to May 8 2004*, ed. D.B. Thomas, R. Baier, E. Own, and T. Valko, Ann Arbor, Michigan: Pierian Press, forthcoming). See also http://blue.butler.edu/~bmatthie/loex04.html.

4. Our exercise is not constructivist learning in the purest sense of the idea. However, constructivism did influence its development, and elements of constructivism are apparent. For more information about constructivist pedagogy, see Susan E. Cooperstein and Elizabeth Kocevar-Weidinger, Beyond Active Learning: A Constructivist Approach to Learning, *Reference Services Review*, 32 (2) (2004): 141–148.

5. We plan to test the acronym and exercise by conducting an assessment of learning outcomes. However, such a project is still in the early stages of discussion.

6. Although he never specifically used the term, it is notable that many of Russell's writings foreshadowed latter work in education that would eventually be called critical thinking. For an excellent overview of a Russellian approach to critical thinking, see the work done by William Hare which was later summarized by Hager: "Bertrand Russell on Critical Thinking," in *The Journal of Thought*, 36 (2001): 7–16; and Paul Hager, "Russell's Conception of Critical Thinking: Its Scopes and Limits," *Inquiry: Critical Thinking across the Disciplines*, 20 (2) (Winter 2001): 11–19.

References

Adler, Renata. 2003. The porch overlooks no such thing. *American Spectator* 36 (5): 14–22.

American Library Association. 2000. The freedom to read statement. Available at www.ala.org/ala/oif/statementspols/ftrstatement/freedomreadstatement.htm.

Association of College and Research Libraries. 1989. *Presidential Committee on Information Literacy: Final Report.* Available at www.ala.org/ala/acrl/acrlpubs/whitepapers/presidential.htm.

_____. 2000. *Information Literacy Competency Standards for Higher Education.* Available at www.ala.org/ala/acrl/acrlstandards/informationliteracycompetency.htm.

_____. 2001. *Objectives for Information Literacy Instruction: A Model Statement for Academic Librarians.* Available at www.ala.org/ala/acrl/acrlstandards/objectivesinformation.htm.

Bartz, Wayne R. 2002. Teaching skepticism via the CRITIC acronym and the *Skeptical Inquirer.* SKEPTICAL INQUIRER 26 (5): 42–44.

Leiber, Justin. 2004. Russell and Wittgenstein: A study in civility and arrogance. *The Bertrand Russell Society Quarterly* (May, 122): 11–22.

Mirsky, Steve. 2003. The Rael thing. *Scientific American* 288 (3): 110.

Russell, Bertrand. 1928. *Sceptical Essays.* New York: W. W. Norton, Inc.

Shermer, Michael. 1989. A skeptical manifesto. *Skeptic* 1 (1): 15–21.

Sokal, Alan D. 2000. *The Sokal Hoax: The Sham that Shook the Academy.* Lincoln, Nebraska: University of Nebraska Press.

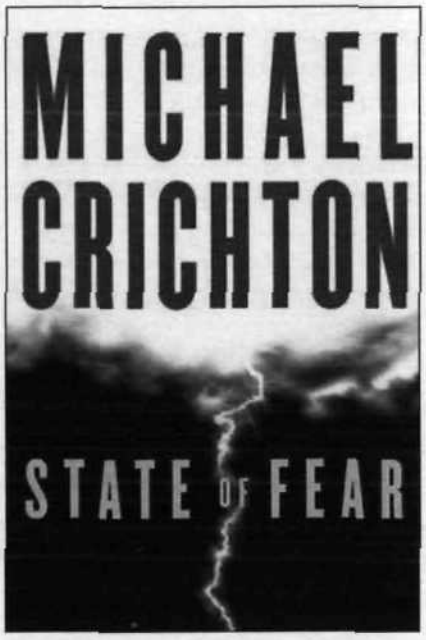
Bad Science, Bad Fiction, and an Agenda

CHRIS MOONEY

State of Fear. By Michael Crichton. HarperCollins, New York, 2004.
ISBN 0-0662-1413-0. 603 pp. Hardcover, $27.95.

Michael Crichton's latest book, *State of Fear*, is a novel in name only. More accurately described, it's a work of thinly disguised political commentary, in which a wildly implausible plot—ecoterrorists supplant Al Qaeda as the leading global menace, unveiling dastardly weather modification schemes to convince the public of a nonexistent global warming threat—serves as an excuse for a string of Socratic-style dialogues about climate science. Since Crichton's characters repeatedly find themselves jetting across the globe to stop the latest ecoterrorist menace (blowing off parts of Antarctica, unleashing a tsunami, and so on), they have plenty of time in transit to question the reality of human-caused global warming. The plot contrivance of a pending climate-change lawsuit (abandoned once its proponents realize they don't have a case) provides yet another didactic opportunity for the author. When the legal team cross-examines one of our heroes about climate science, Crichton seizes the chance to insert temperature-trend diagrams and copious footnotes into the text.

All of these "educational" dialogues take the same format: A smart-guy character, holding forth in technical banter that bears little resemblance to spoken English, runs rings around a character who holds misguided beliefs that he or she cannot defend with reference to the scientific literature. These erroneous



beliefs all hinge on the notion that Earth is warming significantly, that this has resulted at least in part from human activities, and that the consequences have begun to make themselves felt and could grow quite severe over time—a robust mainstream scientific view, although apparently not one shared by Crichton. Hilariously, at the end of his book, Crichton states: "A novel such as *State of Fear*, in which so many divergent views are expressed, may lead the reader to wonder where, exactly, the author stands on these issues. . . ." As if it wasn't obvious.

Crichton's central smart guy is Richard John Kenner, a scientist who heads the fictional MIT Center for Risk Analysis while doubling as a secret agent who likes to bring lawyers and hot babes along on his adventures. Kenner seems a composite of Richard Lindzen, the famed MIT prof and global warming "skeptic," John Graham, who headed the Harvard Center for Risk Analysis *before joining the Bush administration*, and Vin Diesel. In essence, Kenner's character serves as a vessel into which Crichton can pour his agenda-driven reading of the scientific evidence. Here's an example of how Kenner talks:

> There are one hundred sixty thousand glaciers in the world, Ted. About *sixty-seven thousand have been* inventoried but only a few have been studied with care. There is mass balance data extending five years or more for only seventy-nine glaciers in the entire world. So, how can you say they're all melting?

Try reading that aloud and then ask yourself whether real people, even real scientists, speak this way. Though perhaps intended to make Kenner seem smart, such contrived dialogue only makes him seem fake.

Nevertheless, Kenner excels at getting equally fictitious lawyers and Hollywood celebrities to see the error of their ways. But for some reason, Crichton never has his mouthpiece argue against another scientist who

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reads the evidence on climate change differently and can cite literature to back his or her view as well. In the real world you can find a small army of these. I have interviewed many of them, heard others lecture, and met still more at conferences. In Crichton's universe, however, they seem not to exist.

Crichton's scientific footnotes—which he promises "are real"—similarly misrepresent reality. In the text of *State of Fear* as well as in its twenty pages of citations, Crichton glosses over a high-profile 2001 National Academy of Sciences report titled *Climate Change Science: An Analysis of Key Questions*, which opens with the following passage:

> Greenhouse gases are accumulating in Earth's atmosphere as a result of human activities, causing surface air temperatures and subsurface ocean temperatures to rise. Temperatures are, in fact, rising. The changes observed over the last several decades are likely mostly due to human activities, but we cannot rule out that some significant part of these changes is also a reflection of natural variability. Human-induced warming and associated sea level rises are expected to continue through the twenty-first century. Secondary effects are suggested by computer model simulations and basic physical reasoning. These include increases in rainfall rates and increased susceptibility of semi-arid regions to drought. The impacts of these changes will be critically dependent on the magnitude of the warming and the rate with which it occurs.

The mention of "human-induced warming and associated sea level rises" is particularly interesting, because Crichton seeks to debunk concerns about rising sea levels. Crichton's footnotes also exclude statements by the American Meteorological Society and the American Geophysical Union, which broadly agree with NAS. No wonder real-life climate experts, of the sort that Crichton excommunicates from his "novel," have scathingly critiqued his depiction of their field and the level of understanding it has achieved.

As these examples suggest, Crichton's skewed reading of the scientific literature leads him into an utter abandonment of literary verisimilitude. For this author, at least, bad science fuels bad fiction. Nowhere does that shortcoming become more apparent than in Crichton's inability to capture human character. His environmentalists are total creeps; and not just that—they're nefarious schemers, who won't even stop at mass murder to achieve their greater goals. As one ecoterrorist puts it, shortly before Kenner silences him with a bullet: "Casualties are inevitable in accomplishing social change. History tells us that."

Sorry, but I've hung out with plenty of environmental activists (although no ecoterrorists), and they're just not as Crichton describes them. They have many flaws—naïve idealism and political impotence, perhaps—but they're not cold-blooded killers. They would never dream of *causing* the types of disasters they're pledged to work against. In Crichton's fictional universe, however, global warming concerns are all made up. Therefore, environmentalists must transform into outright evildoers—how else to account for their real-life behavior? Crichton should have realized, from the unreality of his characters, that he'd been tugged in the wrong direction.

The author's depictions of journalists have similar flaws. In *State of Fear*, reporters exist solely as environmentalist lapdogs. Crichton makes this plain in a scene in which his characters find themselves watching a newscast:

> They cut to a younger man, apparently the weatherman. "Thanks, Terry. Hi, everybody. If you're a longtime resident of the Grand Canyon State, you've probably noticed that our weather is changing, and scientists have confirmed that what's behind it is our old culprit, global warming. Today's flash flood is just one example of the trouble ahead—more extreme weather conditions, like floods and tornadoes and droughts—all as a result of global warming."
>
> Sanjong nudged Evans, and handed him a sheet of paper. It was a printout of a press release from the NERF [an environmental group] Web site. Sanjong pointed to the text: ". . . scientists agree there will be trouble ahead: more extreme weather events, like floods and tornadoes and droughts, all as a result of global warming."
>
> Evans said, "This guy's just reading a press release?"
>
> "That's how they do it, these days," Kenner said. "They don't even bother to change a phrase here and there. They just read the copy outright. And of course, what he's saying is not true."

In fact, no self-respecting journalist would take an environmentalist press release and copy it verbatim. Members of the mainstream national media *do* view environmental groups as self-interested, and check their claims with independent scientists. What Crichton can't admit, or can't stand, is that in reality these scientists often agree with the environmental groups.

In *State of Fear*, however, Crichton is God, and his views become the book's laws of nature. That's never more apparent than in Crichton's numerous "conversion" scenes, in which characters who had previously believed in the dogma of global warming suddenly see the light. At one point in the novel, two such figures confide in one another following a legal cross examination:

> "I mean, when I gave those answers, I wasn't saying what I really think. I'm, uh . . . I'm asking some—I'm changing my mind about a lot of this stuff."
>
> "Really?"
>
> "Yes," he said, speaking softly. "Those graphs of temperature, for instance. They raise obvious questions about the validity of global warming."
>
> She nodded slowly. Looking at him closely.
>
> He said, "You, too?"
>
> She continued to nod.

Let's face it: such writing is pure porn for deniers of global warming, in much the same way that fictional accounts of UFO-abduction skeptics converting into true believers titillate UFO fans.

In the end, *State of Fear* bears little resemblance to Crichton's most successful sci-fi thrillers, like *Jurassic Park* and *The Andromeda Strain*. Instead, it's far

more reminiscent of *Disclosure*, Crichton's perverse attempt to address the issue of sexual harassment in the workplace by focusing on a case in which a woman harasses a man, rather than vice-versa. Similarly, in *State of Fear*, the specter of a vast environmentalist conspiracy—a problem even less significant than sexual harassment of men by their female superiors—gets trumpeted, while real concerns (climate change, for instance) get scoffed at. By the book's end, one can only ask: What planet is Michael Crichton living on? Because this one is clearly getting warmer.

Editor's Note: The SKEPTICAL INQUIRER invited Michael Crichton to publish in SI his own comments about global warming and the politicalization of science from his viewpoint but received no response.

Kindness Explained

PETER LAMAL

Kindness in a Cruel World: The Evolution of Altruism. By Nigel Barber. Prometheus Books, Amherst, New York. 2004. ISBN 1-59102-228-2. 415 pp. Hardcover, $28.

Why do people donate their blood, leave tips for people they will never see again, and throw themselves on hand grenades that are about to explode? Nigel Barber makes a convincing case that altruism can be understood as the result of evolutionary-adaptationist processes, and he consistently applies an evolutionary-adaptationist framework throughout his new book *Kindness in a Cruel World*. And in doing so, he addresses questions about, and criticisms of, the concept of altruism and its origins.

Barber defines *altruism* as "actions that help another individual at some cost to the altruist." This approach enables us to include nonhuman species in our consideration of altruism. As Barber notes, the biological definition of altruism he advocates is sometimes criticized on the grounds that supposed acts of selflessness are really only selfishness in disguise. If altruistic behavior is biologically based, it is only undertaken to make the altruist feel better, to increase the reproductive success of the altruist, or to increase the prevalence of genes for altruistic behavior. In response, Barber maintains that altruism is real because it is predicated on evolved moral emotions like empathy and shame. Furthermore, humans and other species can engage in altruistic actions that have no ulterior motive, other than whatever pleasure comes from the altruistic behavior itself. And there might also be no delayed benefit for the behavior. In order for altruistic tendencies to have evolved, it was not necessary that *every* altruistic act should have a reproductive payoff; rather, altruistic behaviors should *generally* increase the biological success of those acting altruistically.

The well-established principle of kin selection provides support for the biology-driven perspective on altruism, and Barber points out that the simplest and most widespread type of altruism is parental care of offspring. The principle of kin selection is valuable, because it allows us to make important predictions about people's behavior. But it is important to bear in mind that the predictions derived from evolutionary-adaptationist theory are about the behavior of groups, not individuals. And Barber provides numerous examples of individuals who have behaved selfishly.

Organisms are not born into and do not live in vacuums. As Barber shows, environmental variation has as much to do with altruism (or its absence) as with genetics. The famous experiments of Stanley Milgram and Phillip Zimbardo are part of a large body of research that indicates that aggression and discrimination, in addition to altruism, are traceable to powerful forces of the social environment. As we have been adapted for group life, the influences of our social environment are understandable. This history explains the capacity of humans for altruism toward strangers as well as the frequent hostility of members of an in-group to members of an out-group. The sensitivity of human altruism to the social environment means that it is weakened in developed countries because of the lack of close relationships between people and their neighbors. During our evolutionary history, we behaved most altruistically toward those with whom we lived in close proximity for long periods of time.

Barber maintains that among some mammals, including primates and humans, "moral emotions" may be necessary for altruistic behavior. Such moral emotions as guilt, embarrassment, outrage, empathy, and gratitude are expressed in all human societies. For example, moral outrage at cheats or "free riders" is a necessary enforcement system of reciprocal altruism among humans, and it plays an important role in keeping people honest.

In addition to his exposition of the concept of altruism and its development in humans, Barber discusses the social impact of altruism (kindness) on health, kindness among strangers, conformity as altruism, and when altruism fails. As throughout the book, the topics are illustrated with interesting examples. The book's last section deals with altruism and

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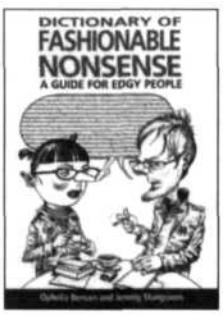
politics broadly conceived and includes discussion of the potential benefits and costs of religion, saving the environment, and criminals ("evil people"). With respect to religion, it is clear that religious belief is neither a necessary nor a sufficient condition for altruistic behavior.

Readers should be aware of the following: Contrary to Barber's glowing description of Pitcairn Island, in 2004 (presumably after this book was sent to the printer), the island's mayor and five other Pitcairnian men were sentenced to prison for a string of rapes and sexual assaults dating back forty years. Barber also conveys the distinct impression that the Kyoto agreement to deal with the world's polluted atmosphere is dead. This is not true. This book is written for a general audience and includes citations of references for those who wish to delve deeper. I highly recommend this book.



Nonsense in Vogue

PHIL MOLÉ

The Dictionary of Fashionable Nonsense: A Guide for Edgy People. By Ophelia Benson and Jeremy Stangroom. Souvenir Press, London. 2004. ISBN 0-285-63714-2. 128 pp. Softcover, $14.

Students of language have long argued that common usages of words are as important as official definitions, since words often soak up assumptions of the day. This causes problems when commonplace usages of words override all other possible meanings. As Francis Bacon observed, language can trick us into uncritically accepting assumptions associated with particular words—a fallacy he called the "idol of the marketplace."

Consider the common advice that "we must be careful not to generalize." This adage implies that generalization is inherently wrong and we should take special care to avoid it. Yet generalization is needed to understand the complex world we live in, and science and rational thought would be impossible without it. In addition, note the paradox that the statement "we must be careful not to generalize" is itself a generalization, so we would disobey the advice if we followed it! Clearly, words like *generalization* carry unstated cultural assumptions that confuse rather than clarify discussions.

When we ignore the biases piggybacking on common words, we perpetuate a kind of linguistic con game. We may convince ourselves that certain words carry inevitable implications, but the perceived implications may not necessarily follow. The implications we perceive may merely come from widely held ideas about the words, and we err if we identify these ideas with legitimate definitions. If we do so, we compromise the intellectual honesty of public debate and contribute to philosophical confusion.

For these reasons, many writers have protested the infiltration of language by unrecognized biases. A few have addressed this problem by writing satirical dictionaries emphasizing the unstated ideas lurking within word usages. These dictionaries often replace the official definitions of words with comical exaggerations of their common meanings or expose deeper truths about the words in question. The great novelist Gustave Flaubert appended such a document to his novel *Bouvard and Pécuchet.* This addendum eventually earned separate publication as *The Dictionary of Received Opinions,* which has been justly celebrated for satirical definitions such as these:

> *Memory:* Complain of your own; indeed, boast of not having any. But roar like a bull if anyone says you lack judgment.
>
> *Principles:* Always "eternal." Nobody can tell their nature or number; no matter, they are sacred all the same.

The American writer Ambrose Bierce also contributed to this genre with his classic book *The Devil's Dictionary,* published in its final form in 1906. The book is a comedic favorite because of its caustic humor (it defines *disabuse* as "to present your neighbor with another and better error than the one he has deemed it advantageous to embrace"), yet its function was partly serious. Bierce, like Flaubert, disliked the prejudices and unexamined ideas packaged in frequently used words and phrases and wanted to do something about it.

Ophelia Benson and Jeremy Stangroom wanted to do something about it too, and *The Dictionary of Fashionable Nonsense* is the result. Proprietors of the excellent rationalist Web site ButterfliesandWheels.com, Benson and Stangroom fight fashionable nonsense of all flavors, whether it's the wishful thinking of Intelligent Design proponents or the latest examples of political groupthink. Some of the nonsense fashionable today was also popular in the days of Flaubert or Bierce, particularly the automatic distrust of anyone claiming authority in matters of knowledge. But our times are also filled with new and more pernicious absurdities, particularly those of an extreme-leftist variety. Radical postmodernism denies that science is superior to other "ways of knowing," and theory-obsessed writers "lean on clotted jargon and tortured syntax to make no point at all." As rational leftists, Benson and Stangroom are rightly concerned about the popularity of such illogical thought in public discourse.

Inevitably, some fashionable nonsense uses the linguistic sleight of hand

Phil Molé wrote "Nurturing Suspicion: What College Students Learn about Science" for our May/June 2004 issue.

discussed here. For instance, as the authors demonstrate, *natural* often serves as a synonym for *good*, thereby implying that all natural herbal remedies are better than "artificial" scientific remedies. The authors explore these biases particularly well, and their satirical definitions are funny and insightful. Ponder these:

> *Anything goes*: Technical phrase in the philosophy of science coined by Paul Feyerabend. Means, roughly, it's too much trouble to explain deduction and induction so go figure them out for yourself.
>
> *Empiricism*: Absurd notion that observation and measurement are useful in finding out about things.
>
> *Herbs*: The best medicine. Natural, organic, pure, wholesome. Can cure everything. Western medicine ignores herbs, preferring artificial chemical substances made in test tubes no one knows how. Herbs are much better because not chemical—chemicals, of course, are toxic.
>
> *Hierarchy*: A highly suspect category. People who accept it are the lowest of the low.
>
> *Human nature*: Fantasy. Fictitious entity, like Santa Claus or the tooth fairy or the free lunch. Humans have no nature, only culture; we can learn to fly, or live in the ocean, or echolocate, or pick things up with our trunks, if we will only concentrate.
>
> *Ideology*: Ideas we don't agree with. Probably exploitative.
>
> *Judgment*: Bad, wicked, excluding, discriminatory attitude to other people's ways of knowing.
>
> *Paradigm*: A thing that shifts, thus proving that scientists merely make up their findings. See KUHN.

Skeptics have probably noticed many of these dubious uses of language without fully understanding the purposes they serve or the reasons they seem attractive as substitutes for real thought. *The Dictionary of Fashionable Nonsense* is valuable because it highlights these tactics in a clear and very humorous way. And this is a noble purpose precisely because, as the authors note, "truth matters. . . . And it also matters because if human intelligence matters, if clear thinking and reason and open eyes are good things, then fashionable nonsense really is important and worth resisting." This book is an excellent contribution to the small but important genre of satirical dictionaries, and is warmly recommended to anyone wishing a deeper understanding of the follies of our time.

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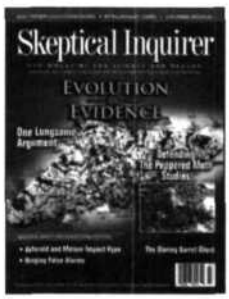

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A Closer Look at *Medium*

WILLIAM HARWOOD

"I'll produce anything that gets high ratings." That was the response of an NBC official in 1977 to a deputation from CSICOP protesting "that network's outrageous pseudodocumentaries about the marvels of occultism."[1]

Nothing has changed. The network that gave the world the intentionally disinformative *In Search Of*, that suppressed known facts in order to create a mystery where none existed, is at it again. *Medium* could have been a legitimate fantasy series about a character with powers that exist *only* in fantasy, comparable with such similar series as *Charmed*, *Tru Calling*, *Early Edition*, and *Quantum Leap*, none of which tried to buy ratings by pretending that the concepts presented exist in the real world. In contrast, NBC continues to claim that *Medium* is based on the real-life experiences of a self-proclaimed psychic. In fact, it is based on a fantasy novel (posing as nonfiction) by Allison DuBois, in which she claims to have solved crimes and demonstrated other extrasensory powers that simply have not been proven to exist. When asked by CSICOP if the network had checked on DuBois's claims and background before they employed her as a consultant for the show, an NBC representative admitted that they had not, and gave the impression that she believed that the show's concept, although not specific scripts, is nonfiction. NBC did, however, remove from its Web site DuBois's claims that she had worked with specific law enforcement agencies while continuing to endorse her claim that unidentified law enforcement agencies use her services.

Nonetheless, instead of beginning the pilot episode with a disclaimer, "This story is fantasy, and has no resemblance to any real person or event," it started with the subtitle, "There really is an Allison. Really." The pilot then concentrated on making DuBois's pretended "powers" seem believable, much the way Uri Geller devoted much of his performances to convincing his audience that he was not a blatant humbug. While *Medium* has entertainment value for persons who believe DuBois's powers exist outside of her own imagination, it is bound to disappoint viewers who recognize that passing off a teleplay about a psychic solving a child's murder as nonfiction contributes to the dumbing of America.

Medium executive producer Gordon Caron, actor Patricia Arquette, and Allison DuBois attend a panel discussion for the television show. Photo by Frederick M. Brown/Getty Images.

Viewers of *Medium* should ask themselves why psychics are not allowed to testify in court cases. The answer is that evidence has to be judged on the basis of science and rationality, rather than hunches that have never been shown to have more validity than those of tea-leaf readers. If self-styled psychics were something other than self-deluded cranks and self-serving humbugs, crime solving would be an exact science, and psychic testimony would be the most valid kind, taking all the guesswork out of rendering a verdict. Unfortunately, there is no such thing as a psychic. No psychic has ever helped law enforcement officers to solve a crime, anytime, anywhere, in any way. A year-long study of such claims led to the conclusion that, as CSICOP Senior Research Fellow Joe Nickell wrote, "careful examination reveals no successful crime solving, but instead only tangled webs of misinformation, generalization, opportunistic credit-taking, and, in some instances, probable deceit."[2]

Michael Shermer, in his book *The Borderlands of Science*, states that when NBC broadcast a pseudodocumentary claiming that Egyptian pyramids were built by an alien civilization 10,000 years ago, "not a single archaeologist, scientist or skeptic of any academic or mainstream credibility appeared on the show to present even an iota of dissent."[3] And lest anyone think NBC is the only or most blatant offender, CBS's *Incredible Discovery of Noah's Ark* and Fox's alien autopsy hoax similarly perpetrated lies. Shermer notes that "Most people that work in the television business realize that most of the claims presented on these paranormal shows are utter nonsense . . . but they were restricted by the networks from saying so on the air." The "vast wasteland's" attitude a quarter-century ago was: If it gets ratings, what does it matter that it contributes to the dumbing of America? The attitude today is: If it gets ratings, what does it matter that it contributes to the dumbing of America?

Since the opening episode, *Medium* has departed from the specific claims made in DuBois's pseudo-autobiography,

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and has switched to stories that even DuBois acknowledges are fictitious, the rationale being that the series is designed to be entertainment, not a documentary. But the repetitive scenes in which the fictitious DuBois has to overcome the skepticism of new investigators in every episode have zero entertainment value and are included only to stress the program's pretense that her claims are *not* fantasy. And whereas the opening episode depicted DuBois receiving information from the past and present by non-sensory means, subsequent episodes showed members of her family of psychics seeing images of the future. Do network apologists not grasp that, for that to happen, information would have to travel backward in time? Or do they consider even that to be within the realm of the possible?

If *Medium* was presented as acknowledged fantasy, making no pretense that its concepts exist in the real world, it would have the potential to be as appealing as programs such as *Charmed.* But viewers lacking the skills or education to distinguish between sense and nonsense have a right not be intentionally disinformed.

Only those whose income depends on putting ratings ahead of truth ask themselves, not, "Is it true?" but rather, "Will the marks swallow it?" To quote myself, "What was once a Vast Wasteland is now a Toxic Dump, administered by the same kind . . . that *Only You, Dick Daring* was unsuccessful in eliminating forty years ago."[4]

Notes

1. Martin Gardner, *Science: Good, Bad and Bogus*, p. xv.
2. Joe Nickell, *Psychic Sleuths: ESP and Sensational Cases*, p. 173.
3. William Harwood, *Where Is George Washington Now That America Really Needs Him?* p. 342.
4. Ibid. p. xx. □

NEW BOOKS

Listing does not preclude future review.

Debunked! ESP, Telekinesis, and other Pseudoscience. Georges Charpak and Henri Broch. Translated by Bart K. Holland. Johns Hopkins University Press, Baltimore, Maryland, 2004. 137 pp. $25, hardcover. Two distinguished physicists, one a Nobel laureate (Charpak, CERN) and one a prominent French skeptic (Broch, University of Nice), team up to expose the tricks of the trade that keep astrologers, spoon benders, and TV psychics in business. They also show how pseudoscientists use science, statistics, and psychology to bamboozle audiences. Along the way they demystify coincidences and radiation and assert the values of science and reason.

Just a Theory: Exploring the Nature of Science. Moti Ben-Ari. Prometheus Books, New York, 2005. 265 pp, $21, paper. A short modern overview of the nature of science—philosophy, history, and sociology—written for a general audience so readers can understand and appreciate the scientific claims that bombard us every day. The goal is to help readers "distinguish claims that are provisional and debatable from claims that are so well established that rejecting them drives you over the border into pseudoscience and antiscience." There are lively chapters on "Just a Theory: What Scientists Do," "Words Scientists Don't Use," "Sometimes Scientists Make Mistakes," and "Science and Religion: Scientists Just Do Science." Short sidebar segments on "revolutionary scientists" such as Darwin, Alfred Wegener, and Judah Folkman give specific examples of views that overcame initial scientific resistance to become, with sufficient evidence, accepted.

True Warnings and False Alarms: Evaluating Fears about the Health Risks of Technology, 1948–1971. Allan Mazur. Resources for the Future Press, Washington, D.C. 2004. 191 pp. $50, unjacketed hardcover; $18.95, paperback. A re-analysis of thirty-one cases involving substances or processes that generated public health warnings and great media interest from 1947–1971. Examples: oral contraceptives, cyclamate, MSG, thalidomide, shoe fluoroscopes, enzyme detergents, mercury in tuna, DDT, asbestos, nerve gas, ELF radiation. The goal is to try to find ways to distinguish true warnings from false alarms and to see how one can make that judgment early in the process. For each warning the author renders a judgment of "true" or "false" and whether the press coverage was hyped or not.

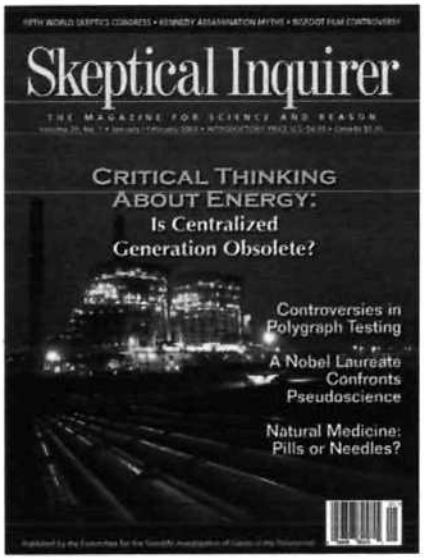
Science Friction: Where the Known Meets the Unknown. Michael Shermer. Time Books, New York, 2005. 296 pp. $26, hardcover. A collection of fourteen essays and research articles exploring the barriers and biases that plague and propel science. They are about how science operates under pressure, during controversies, under siege, and on the precipice of the known. Chapters include "The Big 'Bright' Brouhaha," "Heresies of Science," "Spin-Doctoring Science," "The New Creationism," "History's Heretics," "The Hero on the Edge of Forever" (Gene Roddenberry) and "This View of Life" (the history, science, and philosophy of Stephen Jay Gould).

Creationism: The Bible Says No! Eric J. Hildeman. (Self-published: P.O. Box 341121, West Milwaukee, WI 53219), 2005. 214 pp., paper. A theologian who left the ministry to debate fundamentalists, and creationists in particular, here applies not science (which he respects and admires) but scripture itself to show that, in his view, "a literalistic interpretation of the Bible is dead wrong." His main target audience is creationists, who he hopes to persuade that evolution is not only true but is essential to Christianity's survival.

New in Paperback:

Are Universes Thicker Than Blackberries? Martin Gardner. W.W. Norton & Co., New York, 2004. 288 pp. $14.95, paper. Subtitled "Discourses on Gödel, Magic Hexagrams, Little Red Riding Hood, and Other Mathematical and Pseudoscientific Topics." First trade paperback edition of the last of several collections of Martin Gardner's column "Notes of a Fringe Watcher" that appeared in the SKEPTICAL INQUIRER 1983–2002. (Gardner turned ninety last October.) Among the columns are book reviews and other pieces on a variety of topics. Many of the SI-based chapters are followed by short addendums. The title essay was Gardner's column "Multiverses and Blackberries" (SI September/October 2001).

—Kendrick Frazier □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Natural Medicine: Pills or Needles?

The Case for Decentralized Generation of Electricity

Regarding your article "Critical Thinking about Energy: The Case for Decentralized Generation of Electricity" (January/February 2005): First off, kudos to SI for publishing such a visionary article that is relevant to our contemporary world in which energy demand is causing increasing environmental and geopolitical challenges. All too often, skeptics act as little more than cynics who resist change and defend the status quo, regardless of the consequences. In this case, the skeptics are actually acting as visionaries and are well out ahead of the rest *of society on a vitally important issue—our* ever-increasing demand for energy and how to deliver it efficiently.

One criticism I have of the way the issue is framed in the article is that it dwells on old decentralized-power-generation techniques and fails to focus on modern ones. The author relies on the model of decentralized power generation used in the early twentieth century, in which electricity was generated locally from coal or oil, and the waste heat was then used to heat local buildings. The author fails to even casually mention modern, mainstream decentralized-power-generation options that are in use in the real world today, such as fuel cells, solar/wind, tidal, biomass, landfill gas, etc.

There is no controversy regarding whether or not these decentralized-power-generation technologies are real and viable. I do not understand why the author did not include a broader presentation of the decentralized power generation currently available?

John Coviello
Somerset, New Jersey

The near future of electrical-power generation should be by use of photovoltaic solar panels and wind turbines. Solar panels can cover thousands of square miles of deserts in America and Asia. Wind turbines can be installed by the thousands in the Rocky Mountains and the mountains of Europe and Asia. Wind turbines can be installed also on anchored platforms on the ocean just offshore of all major cities and on top of high-rise buildings. Solar panels can be installed on the roofs of residences, apartment buildings, factories, warehouses, and schools. The resulting pollution-free electric power will also provide power to produce hydrogen gas by electrolysis from seawater for use in hydrogen-fuel-cell cars. We will have economical and pollution-free electric power and fuel in great quantities.

Martin Annenberg
Huntington Beach, California

Thomas R. Casten and Brennan Downes make an excellent case for decentralized generation of electricity. But a sensible argument doesn't seem to go far in this political climate. It may be that the best way to sell this idea is to stress the security aspects of smaller, distributed plants—fewer big targets make it harder for terrorists to disrupt electrical supplies over wide areas.

David B. Lewis
Hamden, Connecticut

It was great to see SKEPTICAL INQUIRER expand coverage beyond pseudoscience and religion. I was impressed with "Critical Thinking about Energy." I brought the article to the attention of my city government, which owns our local power-distribution company. However, I found that the article was overly complex and a bit confusing. For SKEPTICAL INQUIRER, it should have been more concise and simplified.

I do hope that SKEPTICAL INQUIRER will continue to delve into other subjects where groupthink is taking us in the wrong direction. How about "sustainable growth"?

Roy F. Johnson
Columbia, Tennessee

The fatal flaw in the "critical thinking" of the authors is that the waste heat produced by generating electricity must be used when it is made. There is no way to store it on a large scale. In other words, the demand for waste heat must be directly proportional to the demand for electricity at all times. There are only very specialized applications where this can work. Another "critical" flaw by the authors is trying to identify a physical energy problem as a political problem that can be solved by legislation. If only it were that easy.

George Ascroft
H. Douglas Lightfoot
Montreal, Quebec
Canada

What happened to the laws of thermodynamics in "Critical Thinking about Energy"? For one thing, the heat rejected by a gas or steam turbine is not "waste" heat; it is a requirement of these laws. The efficiency of an ideal heat engine is [T(hot) - T(cold)] / T (hot). T stands for temperature and is counted from absolute zero. This is about -460°F. Modern coal electric plants have a T(hot) of about 1000°F, so their best possible efficiency would be 62 percent, if the heat sink (cooling tower or river water) were at 100°F. Other losses unfortunately bring this down to just over 40 percent. However, these low efficiencies are not caused by carelessly rejecting waste heat but are the inevitable consequence of obeying Mother Nature.

Two alternatives are used in practice if there is a second use for the heat from a steam or gas turbine. One is to raise the T (cold) to perhaps 300°F, so useful energy can be extracted from this heat stream. This, of course, reduces the efficiency of the electric plant, and you end up, at best, breaking even. The other is to use heat directly from the boiler or other heat-input device and couple it with a smaller turbine. The electricity generated is less, but you have a source of high-temperature heat that is often required at a factory, such as a chemical-manufacturing plant.

The reason why efficiencies for electrical generation haven't improved since Edison's day is that the laws of thermodynamics have not changed since then. This is not a utility conspiracy. Edison may have been able to use the waste heat because the technology of getting to a low T (cold) had not yet been invented, or perhaps he didn't understand the ramifications of attempting this.

Another important factor not brought up is the subsidies that decentralized electric-power plants get. The electricity they produce, but don't happen to need, their utility is forced to buy. This is a terrible penalty to the utilities, because they don't want or need the additional electrical capacity at night or on weekends any more than the decentralized producers do. How would the decentralized power scheme fare if they had to shut down and sell their power to the utilities during the afternoon electrical demand peak? This would be great for consumers, since supplying the peak is the most expensive part of electrical generation. It forces you to overbuild to meet it. This is also the main reason for the surge in the use of gas turbines in the last twenty years. They're cheap to build and expensive to run, but you only need to run them at times of peak demand.

I think the authors also underestimated or ignored how much more expensive oil and natural gas are compared to coal and nuclear power. Their use would be contrary to the goal of energy independence, and their widespread use is sure to create shortages and substantially raise the price of these fossil fuels for homeowners.

Thomas R. Freeman
Columbia, South Carolina

Thomas R. Casten responds:

Regarding the Coviello and Annenberg letters, deployment of current solar photovoltaic and wind-generation technologies involves deep analysis of government subsidies and their economic effect, which goes beyond the article's examination of whether utilities have made optimal economic choices. Solar and wind generation, while technically proven, have all-in costs substantially above central fossil generation and four to six times the all-in costs of power generated by recycling waste energy. Off-grid or remote solar power is often cost effective, but on-grid wind or solar receive significant subsidies or cause electric users to pay more for power. Yes, governments also use taxpayer dollars to subsidize fossil fuel, hydroelectric projects, and nuclear power and do not require old fossil plants to pay for the environmental damage they cause. Analyzing the economic distortion and resulting damage to standards of living of these subsidies is a fascinating topic but also beyond the scope of our article. Our focus was to show that deploying existing technologies locally would dramatically reduce current power costs and associated pollution by enabling energy recycling.

Ascroft and Lightfoot are largely correct in stating that waste heat from electric generation must be used instantaneously. Thermal energy can be stored economically as hot water, and such storage is widely used in Scandinavian countries to feed hot-water district-heating loops. These hot-water tanks store heat from weekday peak electric generation for use the following night or weekend to heat homes. But storage is not key to recycling heat to most industrial plants, university and medical campuses, and urban district-heating loops. More than 200 combined-heat-and-power plants developed and operated by organizations we have led or helped manage recycle waste heat by feeding base thermal loads and displacing boiler fuel. Extracting more value from fossil fuel by siting appropriately sized generation near thermal users is technically and economically feasible. The power industry fails to optimize because of regulatory systems that tie utility profits to invested capital, ignore or penalize efficiency, give grandfather emission rights to old central plants, and shelter electric generation and distribution from competition.

Contrary to Thomas Freeman's letter, there are no violations of the laws of thermodynamics in the article. The major assertions have been through something better than peer review—extensive and repeated market review. There are multiple examples, often with decades of operating experience, of local generation with energy recycling of every generating technology described. These plants save fuel. They use less fuel to produce heat and power than would be used to produce the same useful energy in separate thermal and electric plants. In spite of many barriers to efficiency, power entrepreneurs have deployed more than 70,000 megawatts of combined-heat-and-power plants in the U.S., producing roughly 8 percent of U.S. power. In Denmark, Finland, and the Netherlands, where many regulatory barriers were removed, roughly 50 percent of all power is generated in combined-heat-and-power plants. The problem is not thermodynamics.

Optimizing the power system is a techno-economic issue. Freeman claims that extracting 300° Fahrenheit energy from an electric plant "reduces the efficiency of the electric plant and you end up, at best, breaking even." Let us be more precise. Steam-turbine plants will generate more electricity as the temperature of heat rejection is lowered. The very best electric-only steam-turbine plants are located next to very cold bodies of water—the North Sea or Lake Ontario—and reject their heat at a few degrees above freezing. Removing the heat at a higher temperature will reduce the amount of electricity produced, but heat at that temperature is useful and can displace boiler fuel. Overall efficiency increases dramatically when 40 percent to 60 percent of the energy in the fuel displaces boiler fuel instead of warming lakes and rivers. Our research, which matches our operating experience, shows that power plants that extract and recycle useful-temperature heat save $10 to $20 per megawatt-hour versus electric-only plants, not exactly "at best breaking even."

Finally, Freeman wrongly assumes that all decentralized generation will use oil or natural gas. The article demonstrates that every fuel, including coal and nuclear, will produce more value in decentralized plants that recycle thermal energy than in central plants that heat lakes and rivers. More important, the cheapest power, which causes no incremental burning of fossil fuel and no incremental pollution, is generated from presently wasted industrial energy—from gas that is flared, heat from process exhaust, and gas or steam-pressure drop. A draft EPA study identified nearly 100,000 megawatts of power—nearly equal to the U.S. nuclear fleet—that could be generated by recycling industrial-waste energy. But U.S. DOE statistics show only 2.5 percent of that potential or 2,500 megawatts of generation based on recycled energy currently being used. Nearly 15 percent of all U.S. power could be produced out of thin air—from industrial-waste energy.

What is the article "Critical Thinking about Energy: The Case for Decentralized Generation of Electricity" doing in SKEPTICAL INQUIRER? I read the Editor's Note; I understand you are "applying critical inquiry to science-related claims and issues of public importance," but this seems far, far removed from the mission and unique role of SI that I, at least, am subscribing for—which is to serve as an expert critic of pseudoscience in our culture.

Michael Abrahams
Boyds, Maryland

Kendrick Frazier responds:

Our main task is—and will always remain—as Mr. Abrahams aptly puts it in his letter, "to serve as an expert critic of pseudoscience in our culture." But we have never been limited to just that role. And for reasons stated in that Editor's Note and in my editorial in our January/February 2004 issue, we will also continue to apply critical inquiry and investigative analysis to certain wider issues that affect

society—especially when we have knowledgeable authors with something unique and important to add that is not available elsewhere, as was the case with this article.

Responding to Demagogues

The article by Vitaly Ginzburg ("Demagogues against Scientific Expertise," January/February 2005) contained a disturbing suggestion near the end that I would hope scientific minds in general will sensibly reject. After spending much of the article bemoaning the advance of pseudoscience, Ginzburg shares an anecdote of how he once informed a journalist he would no longer answer the journalist's scientific questions while his publication continued to promote pseudoscience in the form of horoscopes. He goes on to suggest that a majority of members of the scientific community should take similar stands.

Perhaps I am too uneducated to see the logic here, but it seems to me this is a remarkably poorly thought-out strategy. Surely, the most effective way to combat pseudoscience lies in trying to spread science and rational thinking to the masses as often as one can in order to offset the avalanche of misinformation being promoted. To take the attitude that these publications are unworthy of the benefit of a true scientist's time is hard to see as anything but intellectual elitism. If those who oppose them retreat from the field, the demagogues Ginzburg so disdains simply win the war of ideas by default.

Charles Fusner
Bethlehem, Pennsylvania

Piltdown and Science

Massimo Pigliucci is quite correct to insist that the Piltdown affair should be celebrated as a scientific victory ("Piltdown and How Science Really Works," January/February 2005). Nevertheless, he omits a crucial element that grants the story greater significance. The real hero of the Piltdown story is an infant-hominid fossil found by Raymond Dart. *Australopithecus africanus* fundamentally contradicted the interpretation of hominid evolution represented by the Piltdown skull. The large cranium was not the first hominid characteristic to evolve. Although Dart's interpretations were legitimately questioned by the scientific community, further discoveries of fossils in South Africa corroborated them. By the 1940s, many prominent anthropologists accepted the radical idea that the first hominids were small-brained bipeds. Although few anthropologists today accept *Australopithecus africanus* as a direct human ancestor, the lesson it taught us about early hominid evolution remains valid to this day.

The fact that the Piltdown forgery was falsified by its fundamental contradiction with the fossil record demonstrates the way in which paleontology is conducted. With the discovery of new fossils, an initial hypothesis is proposed to establish their *place within the present understanding of* evolution. Each claim will be skeptically evaluated relative to the quality of evidence that supports the claim and will always be subject to the challenge of the discovery of still more new fossils. Within the evolving paradigm of hominid evolution, Piltdown became a serious anomaly that did not fit the evidence and therefore warranted re-evaluation. It would be reasonable for the antievolutionists that cite the Piltdown forgery to acknowledge the role that authentic fossils played in exposing the forgery. If they are unwilling to be reasonable, then it is our obligation to remind them of these facts.

Dennis C. Shaw
Instructor of Anthropology
Lower Columbia College
Longview, Washington

Early Humans' Ability to Talk Key

Regarding Ralph Estling's comments about the organization of Cro-Magnon brains compared with those of Neanderthals ("Stupid Things," January/February 2005): Estling speculates that the Cro-Magnons' main advantage was a brain evolved to a state of superior organization, making it possible for them to "conceive vastly more."

He does talk about their sophisticated linguistic abilities, but attributes this to their better-organized brains, which, he says, made this talk possible. It is at least as likely that the cause of the more sophisticated Cro-Magnon culture is simply the ability to talk. There has been speculation that the Neanderthal had a more limited vocal apparatus that was more like that of apes. If this were so, then—no matter how well organized their brains—the Neanderthals would have been unable to pass on their acquired skills to others beyond the simple imitation shown by apes. There would have been no cumulative development of culture—no "standing on the shoulders of giants." They would have been left continuously reinventing the wheel, while the skills of the Cro-Magnons were steadily improving.

This is consistent with the relative stability across hundreds of thousands of years of pre-sapiens human cultures compared with the explosive advance *of Homo sapiens.* It is the ability to learn from the mistakes of others rather than our own that makes a complex civilization possible.

Paul K. Brandon
Psychology Department
Minnesota State University
Mankato, Minnesota

JFK Assassination Car

In the photograph of a presidential motorcade in the article by Massimo Polidoro, "Notes on a Strange World: Facts and Fiction in the Kennedy Assassination" (January/February 2005), the open-top Lincoln Continental in the photograph on page 22 is white. The Zapruder film and other contemporaneous photographs clearly show the president, Mrs. Kennedy, and Governor Connally riding in a *black,* open-top Lincoln on November 22, 1963. Other details also make it unlikely that the published photograph was taken in Dallas on the date of the Kennedy assassination: i.e., the unidentified person seated to the left of the First Lady, and the absence of Governor Connally in the jump seat just in front of the president.

In defense of the SI editors, the published photo caption is vague but not, technically speaking, wrong, in that it identifies the date as November 1963, not specifically November 22, 1963. While the photo and caption are not technically wrong, SI readers who are too young to remember the Kennedy assassination could easily be confused by the publication of a "stock" photo image in a conspiracy-debunking article. The photograph and caption should have been as carefully vetted as the text.

Robert J. Coffey
Thousand Oaks, California

Kendrick Frazier responds:

Mr. Coffey is correct. The photo we used was not of the presidential motorcade on that

fateful day of November 22, 1963. We should have published a photo from that day.

Images and Expectations

As a boy growing up in Spain in the 1970s, I was subjected to many TV discussions of the "inexplicable" faces in Belmez de la Moraleda, and I used to be scared by sensationalist radio shows exploiting this "mystery." Somehow, I grew up to be generally skeptical of such phenomena. That is why I enjoyed Joe Nickell's piece titled "Rorschach Icons" (November/December 2004). May I suggest one more reason for skepticism? If our brains are rigged to see what we expect to see, that explains why no Protestant ever claims to have seen the Virgin Mary but only Jesus, while Catholics report seeing either of the two.

Jose Antonio Cabo
Villaviciosa
Spain

Ghost Ship *Mary Celeste*

Terence Hines's review of Brian Hicks's *Ghost Ship* (January/February 2005) implied that the book presents a new theory about what happened to the crew of the *Mary Celeste*. I have not read Hicks's book, but based on the review, his theory is a rehash of the one presented in great detail by Charles Edey Fay in *The Story of the* Mary Celeste (Salem, Massachusetts: Peabody Museum, 1942; reprinted in 1988, New York: Dover Books). Fay carefully analyzed the testimony of the eyewitnesses who found the ship, the prevailing weather patterns in the Atlantic, and nineteenth-century maritime practice in general. His conclusion was the same as the one that Hicks proposes: that the crew temporarily took to the boat because they were concerned about leaks in the ship's cargo of alcohol.

In particular, Hines incorrectly stated that Hicks is the first to make the point that the crew apparently intended to return to the ship. Fay described in detail how they (apparently) rigged the main peak halyard as a towline, presumably because it would be quicker than breaking out a new line from the lazarette.

Hines opined that Hicks "has written the definitive work on this case." Based on the review, *Ghost Ship* actually adds nothing to Charles Fay's exhaustive work.

Peter Ansoff
Alexandria, Virginia

The alcohol theory of the *Mary Celeste* was described by John Harris in his book, *Without a Trace: A Fresh Investigation of Eight Lost Ships and Their Fates* (New York: Atheneum, 1981, pp. 42–79), in which he credits Sir William Crocker. This can be found in an article by H.H. Trotti that appeared in the *Georgia Skeptic* electronic newsletter (January/February 1991) and was reprinted in *The Skeptic* (March/April 1991). I wonder whether Brian Hicks has been decent enough to mention this earlier source just as Harris and Trotti did.

Jan Willem Nienhuys
Waalre
The Netherlands

The theory that the ship was abandoned because of alcohol vapors has been around in one form or another since at least J.G. Lockhart's *A Great Sea Mystery* (1927). And Hicks is certainly not the first to suggest that Captain Briggs and associates intended to leave the ship only temporarily and return later, as the review states. Captain Morehouse, who found the *Mary Celeste* back in 1872, offered this interpretation.

And it isn't correct to say that Briggs and others took nothing with them. The ship's papers were not on the *Mary Celeste*, and (as the most reasonable explanation) they must have been taken along by Briggs. This poses a problem: Why did Briggs take the papers if he intended to return in a few hours? And why not the log, which is usually considered prime?

Everett F. Bleiler
Interlaken, New York

Terence Hines responds:

Hicks does mention Fay's 1942 book, calling it a "fine work of scholarship" (p. 9) and discusses that author's theory at some length. Hicks's theory, however, differs from Fay's in several respects, based on new evidence uncovered since Fay wrote.

Hicks does not mention John Harris, his 1981 book, or Sir William Crocker.

ID's, Raelians' 'Designer'?

Re: "Raelian Update: Sex, Pseudoscience, and Sacrilege" (News and Comment, January/February 2005):

Here's an idea: host a debate between Stephen C. Meyer of the Center for Science and Culture and Rael of the Raelians concerning the nature of the "designer" in Intelligent Design. That way, the Christian believers in ID can see who they've ideologically "shacked up" with and Meyer can point out the obvious flaw in the Raelian's view, that it only begs the question of life's origins to say it was brought here from an alien civilization. You could kill two birds with one stone—and provide skeptics with a memorably bizarre and entertaining event.

Kent Barnett
Fayetteville, Arkansas

History of Science: *H. Pylori* and the Making of a Myth

This is Kimball Atwood's response to letters in our March/April 2005 issue about his article "Bacteria, Ulcers, and Ostracism?: H. Pylori *and the Making of a Myth" (November/December 2004).—EDITOR*

I am happy that readers seem to have found my article entertaining and instructive. I'm also happy to report that Barry Marshall, the protagonist of the *H. pylori* story, caught wind of it and wrote me, in part: "I must say that it was well researched and true enough. Given the communication systems in place in the 1980s (pre-Internet) I agree that 10 years was about right for acceptance to occur, as it did in 1994. Also, there is always a discrepancy between what comes out of my mouth and what ultimately appears in the medical page of the Sydney *Morning Herald*." I grant the last point and apologize to Dr. Marshall for not having given him more benefit of the doubt.

Donald Weitzel wonders if the considerable time that elapsed between early reports of bacteria found in human stomachs and the eventual characterization of *H. pylori* constitutes evidence of ostracism. It does not, for the same reasons that Alan Harris discusses in his letter about continental drift. Over the decades following 1930, there were sporadic reports of bacteria found in human stomachs (demonstrating that investigators paid attention when they found them), but these findings were not necessarily associated with diseases and, more to the point, could not reliably be reproduced. The bacteria that Weitzel read about were streptococci, now known to have been contaminants.

At least two distinct technological advances were necessary to set the stage for the discovery and characterization of *H. pylori*: first, a simple and safe method for obtaining gastric mucosa specimens from live patients had to be devised; second, the field of bacteriology had to appreciate the existence of highly fastidious organisms and devise methods for growing them in culture. Suffice it to say that these advances were not fully in place until the 1970s, at best.

Harold Scarbro takes issue with my dismissal of "stress" as a cause of peptic-ulcer disease (PUD), offering several pieces of evidence to support the stress hypothesis. Space precludes a comprehensive discussion, but here are a few points:

1. I'm not sure what "stress" is, and neither are those who tout it as a cause of disease. More precisely, its definition varies from study to study.
2. All associations between mental stress and peptic ulcers are complicated by confounding variables, some of which were unknown at the time the associations were noticed. An obvious example from Scarbro's list: "ulcers increased dramatically after disasters such as the London blitz and the Kobe earthquake." *H. pylori* is transmitted by the fecal-oral or oral-oral route and is far more common in crowded, unsanitary conditions such as occur in disaster settings. Since the organism was unknown at the time of these disasters, it didn't occur to anyone to look for it. Headaches are also associated with "stress," and their most common treatments are nonsteroidal anti-inflammatory drugs (most notably aspirin)—now known to be the other major cause of peptic ulcers. Cigarette smoking and alcohol consumption are also independently correlated with both stress and ulcers.
3. Prospective studies that define "stress" from the outset and control for confounders would seem to be the most likely to yield reliable data, but these have shown an inconsistent correlation between "stress" and PUD. Scarbro mentions one such study in which subjects who scored "highest on a perceived stress scale were 2.9 times more likely to develop ulcers," but a similar study found an odds ratio of 1.7 with a 95% confidence interval of 1.0–3.1—hardly convincing. Neither of these studies controlled for *H. pylori*.

Glenn McQuaig was a drug salesman during the "ulcer wars," presumably the 1980s. He writes, "Dr. Atwood apparently underestimates the tremendous pressure put on the medical community by the pharmaceutical industry. . . . Quite frankly, the physicians never stood a chance." He concludes that this pressure delayed acceptance of the *H. pylori* hypothesis.

My article has already refuted McQuaig's last assertion. Regarding drug salesmen exerting pressure on physicians, this certainly occurs. The question is whether physicians are as vulnerable to such pressure as McQuaig thinks. I argued last year, in my reply to Myra Jones, that "virtually all doctors recognize drug salesmen for exactly what they are: salesmen" (SI, January/February 2004). A recent study agrees:

> Pharmaceutical drug companies spend upward of $25 billion per year on promoting new drugs and distributing free samples to doctors, but new research shows such marketing devices have little impact on physicians and their prescribing behavior. . . .
>
> Scientific papers, advice from colleagues and a physician's own training and experience also influence prescribing practices and, he said, most physicians view these sources as far more reliable and trustworthy than salespeople. [Gardner 2004]

Not that this has anything to do with the original point of the article, which is that the story of *H. pylori* lends no support to the argument that implausible medical claims deserve to be investigated.

Kimball Atwood, M.D.
Waban, Massachusetts

Reference

Gardner, N. 2004. Pharmaceutical marketing tactics hold little sway with prescribing physicians. EurekAlert Web site. Accessed 12/04 at: www.eurekalert.org/pub_releases/2004-12/uow-pmt120604.php.

Off the Mark

Even letter writers should not be allowed to get away with blatant untruths. In the November/December 2004 issue, George Rowell states: "One study found that 10,000 Americans were murdered each year by murderers released from prison." Since there are about 20,000 murders each year in America, he would have us believe that half are committed by murderers released from prison, which seems rather extreme. The only official source I could find in a few minutes on the Internet was a report from the Washington State Department of Corrections, which suggested that about 3 percent of murders are committed by persons previously convicted of that crime. Mr. Rowell seems to be off the mark by a factor far exceeding ten.

Barry G. Clark
Socorro, New Mexico

The letters column is a forum for views on matters raised in previous issues. **Letters should be no more than 225 words.** Due to the volume of letters not all can be published. Address letters to Letters to the Editor, SKEPTICAL INQUIRER. Send by mail to 944 Deer Dr. NE, Albuquerque, NM 87122; by fax to 505-828-2080; or by e-mail (send as e-mail text, not as an attachment) to letters@csicop.org (include name and address).

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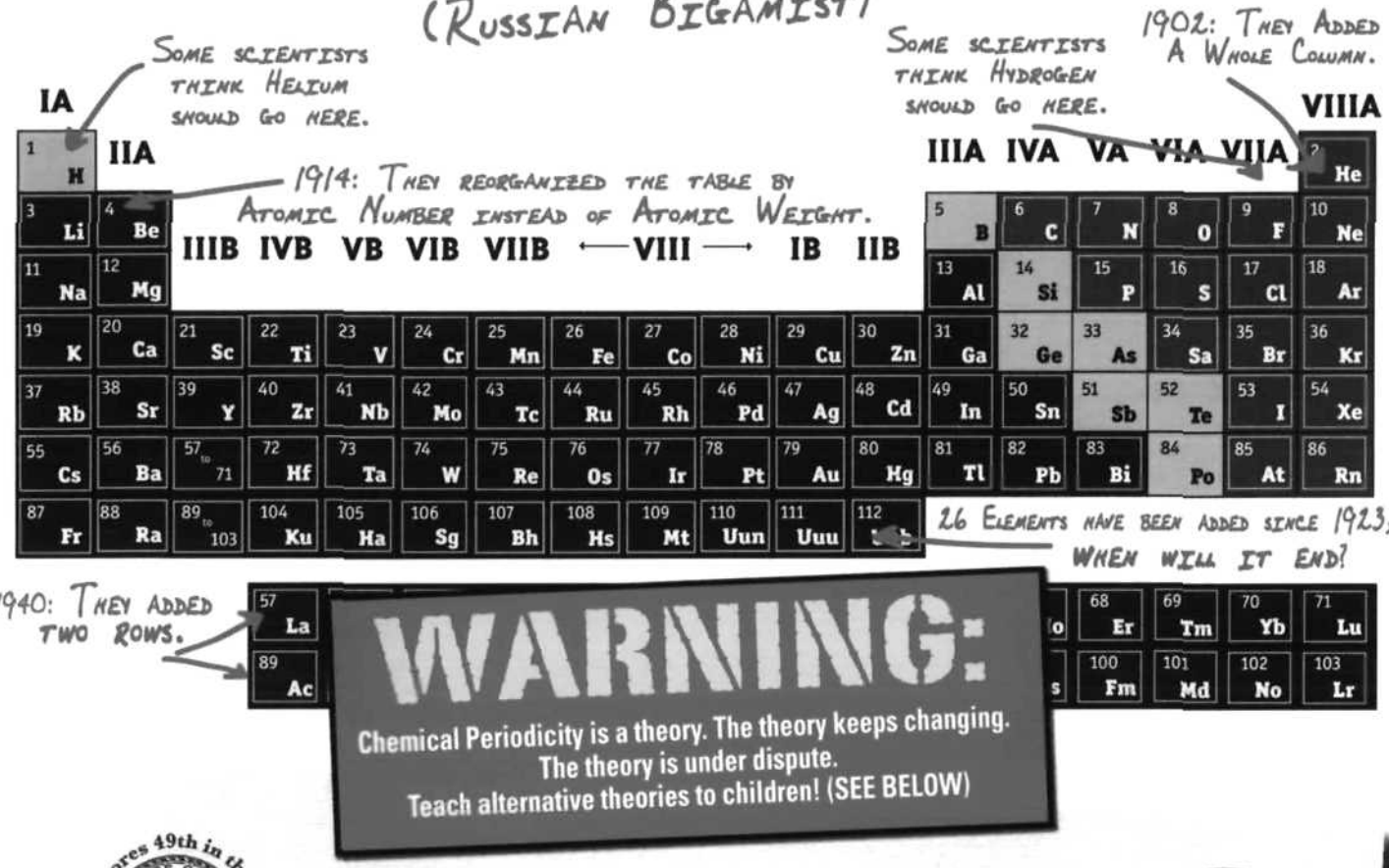
Periodic Table of Elements

1869, by Dmitri Mendeleev

(Russian Bigamist)


Some scientists think Helium should go here.
1902: They Added A Whole Column.
Some scientists think Hydrogen should go here.
IA
IIA
IIIA IVA VA VIA VIIA
VIIIA
1914: They reorganized the table by Atomic Number instead of Atomic Weight.
IIIB IVB VB VIB VIIB ←VIII→ IB IIB
26 Elements have been added since 1923, When will it end?
1940: They added two rows.
WARNING:
Chemical Periodicity is a theory. The theory keeps changing.
The theory is under dispute.
Teach alternative theories to children! (SEE BELOW)

SAT Scores 49th in the Nation
STATE OF GEORGIA 1776

The Official Cobb County Table of Elements

Earth	Fire	Air	Water

Evolution
Plate Tectonics
Big Bang
Reason

The Truth is Constant

-Loren Williams Georgia Tech 2005